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Indexed in the Industrial Arts Index and
the Engineering Index. Published every
Thursday. Subscription Price United
States, its Territories and Canada \$8;
other Western Hemisphere Countries
\$15; Foreign Countries \$20 per year.
Single copy, 35c. Annual Review Num-
ber, \$2.00.

Cable Address, "Ironage" N. Y.

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Vol. 162, No. 21

November 18, 1948

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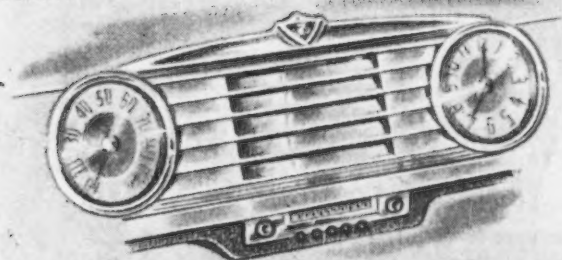
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Out in Front

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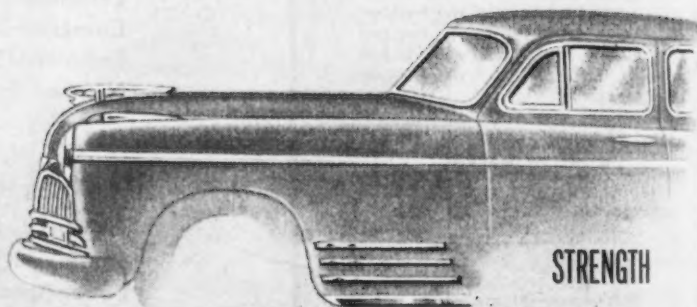


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100 E. 42nd ST., NEW YORK 17, N. Y.

ESTABLISHED 1855

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November 11, 1948

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Is It a Mandate?

LABOR and one faction in the Democratic Party claim that the election results constitute a "mandate" from the people, that this "mandate" calls for repeal of the Taft-Hartley Act and enactment of the left-wing price control and tax program. The victorious party will be well advised to go slowly in discharging this "mandate."

In the first place it is reasonably clear that the victory of Truman was a personal tribute to a courageous fighter who carried on against overwhelming odds, not the least of which was the lethargy of top flight politicians in his own party. Without detracting from the President's magnificent effort, it is not unfair to say that the Republicans lost the election rather than that the Democrats won it. On the basis of votes cast in other presidential elections, it was expected that not less than 51 million voters would go to the polls. Actually only 46 million voted.

In spite of the ridicule directed at the professional pollsters, the fact is that they did a good job in gaging *voter intentions*. There is no reason to suppose that the techniques which experience has proven sound should suddenly go completely haywire. It is reasonable to suppose that a large majority of those who did not vote were Republicans and their failure to go to the polls spelled the difference between *intention* and *deed*.

The final count shows that Truman received less than half of the votes actually cast. In five states—California, Illinois, Ohio, Nevada, and Idaho, with a total vote of 10,807,801 cast for the two major candidates, the President's plurality was 107,859, a margin of approximately one per cent. These five states have an electoral vote of 85. Had one voter in every 200 in these states changed his choice, these 85 electoral ballots would have gone to Dewey and left the final count Dewey 274, Truman 219.

The apathy of the voters was overwhelmingly on the Republican side. This was due, we believe, to the manner in which the G.O.P. waged its campaign and to a fundamental fallacy underlying the Republican propaganda thesis. The Dewey high command took victory for granted, a presumption which many voters resented. In the second place, the G.O.P. leadership refused to tell the voters what they were getting, except in terms that were so general and equivocal as to have little meaning. Keeping the campaign on "a high plane" also kept them from giving the public compelling reasons for changing administrations, reasons which the record of the last 16 years provides in abundance.

That these are the valid reasons for Truman's success and not his advocacy of Taft-Hartley repeal or reimposition of controls is indicated by his ability to maintain his margin over Dewey after the counting left the big cities. The farmers certainly did not vote for him because they thought organized labor was being abused. In the state of Arizona the voters gave the President 56.7 per cent of the ballots cast for major party candidates, compared with 52.3 per cent for the country as a whole. The voters of this state at the same time had a chance to express themselves on the only clear-cut issue of the campaign, namely, the power that organized labor may enjoy. They gave thumping majorities for three anti-labor referenda. Obviously the Truman majority here rested not on issues but on personality.

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► While U. S. Steel Corp. will continue to strive and hope for legalized basing points, it is not counting on them. Wherever possible, it appears to be taking the mill to the consumer. This is evidenced by the complementary cold reduction mills on the West Coast. Both will have capacity of more than 300,000 tons. The mill at Pittsburg, Calif., will specialize in tinplate while the one in the Los Angeles area will concentrate on cold rolled steel. Both specialties are suited to the consuming areas in which the mills are located.

► Progress in engineering of automotive power plants is reflected in the new engine recently introduced by Cadillac. The previous Cadillac engine had 346 cu in. and developed 150 hp. The new high compression engine has 15 less cubic inches, yet it develops 160 hp. It weighs nearly 200 lb less than the old engine and occupies less space. In addition, using a 7.5 compression ratio, the new engine offers 15 to 20 pct greater fuel economy.

► The Office of International Trade is considering the prohibition of exports of iron ore. This would be a precautionary measure since iron ore has been exported only to Canada during the past several years and exports to that country are not affected by U. S. controls. Exports of iron ore last year amounted to 2.8 million tons and for the first 6 months of this year 1.6 million tons—all to Canada.

► Dow Chemical Co. has informed the government that immediately after the war it would have cost \$400,000 to place the Velasco, Tex., magnesium plant in a standby condition. But they estimate present cost of the project to be \$5 million. The higher cost of reactivation now is due partly to the need for rebuilding cells under attack by magnesium chloride. Some power plant facilities would also have to be installed since that was largely second hand equipment originally and has been in use by Dow under lease to supply its Freeport, Tex., operations. Silver bus bars had been in use in this plant but these have been removed.

► In addition to the automotive companies that have already arranged for Pittsburgh district plants, both Briggs Body and Kaiser have been scouting the area. Reliable sources indicate that the New York Air Brake Co. has already made plans to move to Pittsburgh. Whether f.o.b. mill steel sales go or stay appears to make little difference now—rising freight rates are calling the turn.

► Scrap suppliers to conversion ingot makers are working on a 10 to 1 ratio. For every 10 tons of scrap they sell at market price—they get back 1 ton of sheets at mill price.

► The Geneva, Utah, plant of U. S. Steel Corp. is gaining increasing stature in future plans of the corporation. Plans call for the Geneva plant to supply semi-finished steel for the operation of both of the Corporation's new cold reduction mills in California.

► The future is almost certain to witness more automobiles and automotive parts production in Pittsburgh and other steel producing centers—and more steelmaking in Detroit. Important developments in both Pittsburgh and Detroit are currently taking place. Detroit is beginning to be concerned about its position as a plus market for scrap.

► A new process for manufacturing prealloyed steel powders directly from the molten state is now in the production testing stage and may soon be put on the market.

► Freight car production which fell about 1000 units short of the 10,000-car a month goal in October will be back near 10,000 this month if no further labor troubles intervene.

► Some segments of the machine tool industry have been renewing contracts with machine tool dealers in Germany which would seem to tie in with resumption of production on a supervised basis in the Ruhr.

► Participation of steel companies in iron ore beneficiation research programs is beginning to look more and more like a public relations or industry relations gesture in view of the current interest in foreign ore deposits.

Die Setting and Economical

Improper die setting in punch press operations drastically reduces die life, and can be the cause of out-of-parallel press frames, misalignment of ram ways to the press bed and extremely high production and maintenance costs. Some "Do's" and "Don'ts" for the die setter are given in this article, and a program for training die setters is outlined.

By E. H. GIRARDOT
Punching, Tool and Die Div.,
General Electric Co., Schenectady

THE importance of proper setup of punch press tools is frequently underestimated.

Extra costs and other losses that are actually caused by improper die setup are often erroneously charged to faulty die design or construction, because the troubles experienced cannot always be clearly traced to the setup. While broken or chipped die sections may be caused by faulty design, construction, or the use of tool steels not suited for the job at hand, an analysis of the die setting methods used should be made before such conclusions are reached.

A typical press shop that produces a varied general class of punched parts carries a heavy investment in machinery. The cost of individual machines varies from \$1000 for small O.B.I. presses to upwards of \$50,000 for large automatic and double action presses. In addition, considerable continued expense is involved in keeping the presses in good operating condition.

This press maintenance is often increased because of such factors as wear of crankshaft, pitman bearings and ramways; and misalignment of ram and bed faces, spring press frames, and bolsters that result from such improper setup procedure as the use of bolsters providing in-

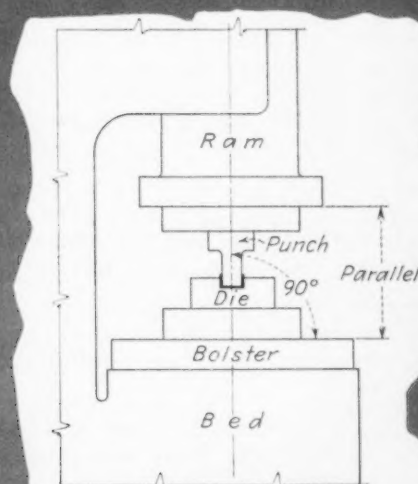


FIG. 1—Theoretical relationship of ram motion, ram and bolster faces at bottom of work stroke. A solid line of metal exists between the ram and bolster through the punch and die members and the punching. Ram and bolster faces are parallel and the ram slide motion is at right angles to the bolster. Actually, some deflection is experienced.

Punch Press Operation

sufficient die support and the overloading of presses by too deep a setting on jobs which bottom.

Although it would be difficult to establish definite figures representing normal maintenance costs in any shop, a careful examination of actual expenditures shows many items traceable directly to press overloads resulting from improper setting of the dies. Reduced maintenance expense can thus be anticipated through the inauguration of a regular training procedure for die setters.

Forming, bending, embossing and other die types, wherein the work is bottomed, require considerable experience on the part of the die setter to insure proper setup. Tests made in hydraulic presses to determine the pressures required by various dies which bottom indicate that little appreciable effect is noted in the punching after overloads as great as 100 pct if the punching is of sufficient area to resist coining.

For example, a formed part was satisfactorily produced with a pressure of 30 tons. Even when this pressure was increased to 60 tons, the punchings produced at each pressure could be clearly identified from each other.

The setup of such dies tests the skill of the die setter, since the common screw-adjusting pitman must be set by feel. All presses are so designed that the deflection of their members will remain well within the elastic limit of the materials of which they are made, when exerting full rated pressure. This is shown in fig. 1. If the ram is set too deeply, the press frame and bolster would be deflected to accommodate this excessive depth setting, resulting in press overload, as shown in fig. 2.

Referring again to the part that required 30 tons to form, and assuming that it is set up in a 35-ton O.B.I. press, good judgment on the part of the die setter is essential if press overload and excessive deflection are to be avoided. Too deep a ram setting would not materially improve the appearance of the punching, but the excessive deflection caused by this improper setting might exceed the elastic limit of the material in the press frame. The effects of too deep a ram setting are shown in fig. 2. In this event, the frame would assume a permanent set, resulting in misalignment of the ram and bed faces. This misalignment might assume either of two forms, or a combination of both.

If both sides of the press frame were to stretch evenly, an out-of-parallel condition of the ram and bed faces from front to back of the press would result. If only one side of the frame were stretched, the out-of-parallel condition would be from right to left. An uneven stretch of the frame sides would induce a combination of these two forms of misalignment.

Inspection of presses of this type has shown that out-of-parallelism between the ram and bed faces is a common fault, indicating that these presses were being overloaded.

Another objectionable condition caused by overloading is a misalignment of the ram ways to the press bed, which causes an improper angular motion of the ram in relation to the bed. Since a major overhaul is required to restore a press misaligned because of overloading, it is essential that overloading be avoided in order to keep press maintenance costs at a minimum.

If a misaligned press of this type was used for blanking work, particularly on thin materials, a greatly reduced number of punchings between die grinds would result, because the punch and die members could not be properly aligned. Economical operation of blanking dies can be attained only if the cutting faces of the punch and die members are maintained parallel to each other during the cutting cycle, and if the clearance pro-

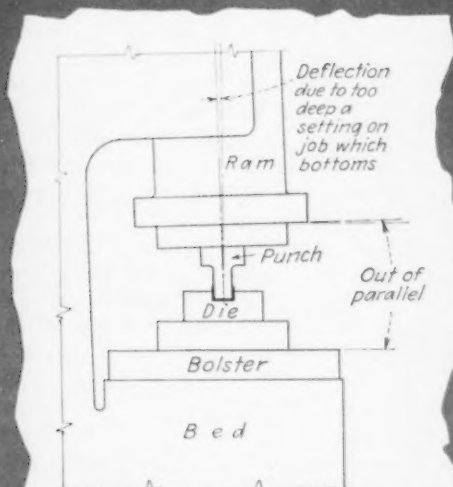


FIG. 2—Too deep a ram setting on jobs that bottom cause press frame deflection since the metal through the die and punching between the ram and bolster is incompressible. Excessive deflection may result in a sprung press frame or even breakage of the frame or die.

vided between the punch and die be evenly divided around the contour.

Some dies may have shear provided on either the punch or die to reduce the cutting pressure required. In this event, it is still essential that the die clearance be evenly divided around the blank contour to avoid injurious metal-to-metal contact between the punch and die members.

Parallelism of punch and die members and an even distribution of the die clearance cannot be attained if an out-of-parallel condition exists in the punch press. A die clearance of about 6 pct of the material thickness is commonly used, so a clearance of only 0.0015 in. is usually provided at any point between the punch and die when cutting 0.025 in. thick material. It is evident that only a slight misalignment would result in metal-to-metal contact, with resultant injury to the cutting edges. The results of improper setup might thus be reflected in decreased die life and increased die upkeep costs, as well as in the additional maintenance costs required to restore the press to proper alignment.

Draw dies for round shells that are run in single-action presses equipped with cushions require special setup knowledge. Blankholding pressure must be evenly distributed over the blank area and of sufficient force to prevent wrinkling without retarding the natural flow of material into the die. This optimum pressure can only be determined by trial, with reliance on the experience and good judgment of the die setter.

Adjustment of blankholding pressure is a relatively simple matter with pneumatic or hydraulic cushions, but becomes more difficult with spring cushions. In the latter case, pressure is varied by the amount of initial compression given to the springs by manual adjustment.

Draw, or blank and draw dies that are run in double-action presses require the same critical attention to proper blankholding pressures. Here, however, adjustment is made by means of studs located in the four corners of the blankholder ram. Obviously, considerable skill is necessary to insure an even distribution of force over the blank area. Regardless of whether a single or double-action press is used, however, the application of either excessive or insufficient blankholding pressure results in an abnormally high percentage of rejected work.

The setup of draw dies in double-action presses is another situation that is often mishandled. The draw punch must enter the die centrally, so that the clearance is evenly distributed about the contour. The use of dummy shells or strips of material, inserted around the contour between punch and die, is not recommended since no assurance is given that the punch ram is not crowded to one side in its ways.

A more satisfactory method is to mount the draw punch securely in its ram, then lower it into the draw die and use feelers to divide the clearance evenly before clamping the die. In this manner, centralized location is insured, since the punch ram is hanging free in its ways and the die is located to suit the punch.

Draw work on other than round shapes may impose more difficult blankholding problems. It

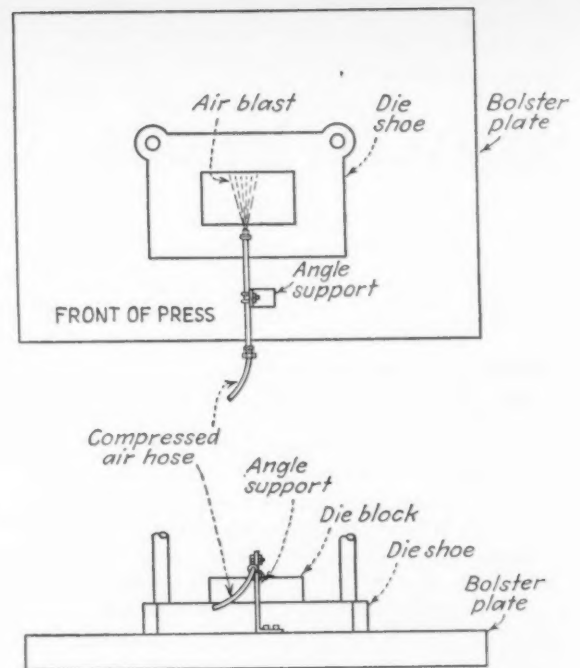


FIG. 3—Shown here is a common method of setting up an air blast for removing punchings from dies during the up-stroke of the ram. Mounted on the bolster by the die setter, its efficiency varies with his skill, since he must aim the blast at each setup. Vibration during operation may cause the nozzle to shift, with resultant troubles.

is sometimes necessary to vary the pressures over the blankholding area and to apply greater pressure at certain points. Such jobs further complicate the setup problem and require maximum experience and the use of extreme good judgment on the part of the die setter.

Dies also represent a heavy investment, ranging from \$100 for simple dies to upwards of \$10,000 for the larger and more complicated types, particularly those for cutting operations. Die life and maintenance, major items in press operation, may be directly affected by careless or improper setup. On dies which bottom, such as form dies, excessive pressures tend to coin the punch and die sections into the softer material of the die set, with subsequent misalignment of the punch and die members.

In the case of cutting dies, improper alignment of the punch and die members in setup may seriously affect die life and maintenance costs. For example, since a die clearance of 6 pct of the material thickness is recommended there is a clearance of only 0.0009 in. between the punch and die when cutting 0.015 in. stock. This means that almost perfect alignment of the die members must be established during setup, and maintained when clamping them to the ram and bolster.

Extreme caution should be exercised to insure that the upper holder is securely clamped flat to the ram face before the lower holder is fastened to the bolster. This is particularly true in the case of punch holders held to the ram by means of shanks. Dirt or burrs on the shank, the top surface of the punch holder, the ram face, or in

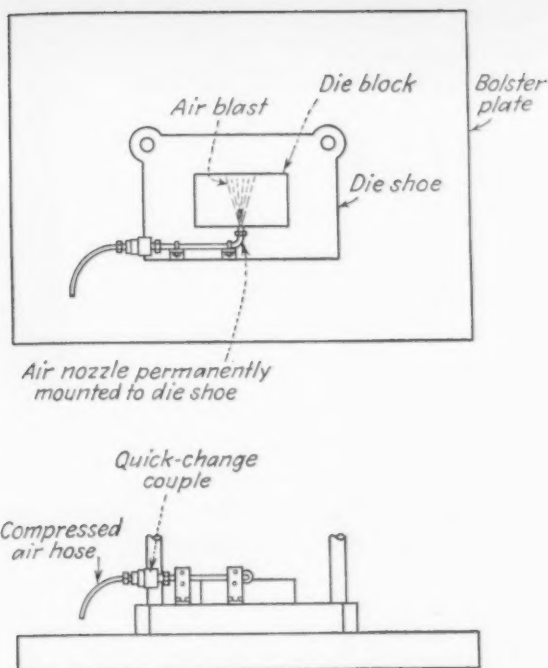


FIG. 4—A recommended method for removing punchings from the dies by air blast is where the nozzle and connector tube is permanently mounted on the die by the die maker. The die setter merely connects the air supply by a quick-change coupling. This gives positive assurance of trouble free air ejection in addition to reducing die setting time.

the ram shank hole may all keep the punch holder slightly out of alignment when the die is set up. Under cutting pressure, the punch holder may be forced into proper relation with the ram, causing misalignment with the die. Very little movement is required to result in metal-to-metal contact between the punch and die, with a resultant decrease in the number of punchings produced between grinds.

Improperly functioning dies and frequent die or press breakdowns are often reflected in dissatisfied press operators. Most press work is performed on a piece work basis and the operators develop a work rhythm in keeping with the job at hand. Improper feeding material, faulty ejection of completed blanks, or other minor operating troubles cause a break in this rhythm. Two methods of removing punchings from the dies by air blast are shown in figs. 3 and 4.

The die setter is in an excellent position to contribute towards the design of better and more trouble free dies. He is aware of operating troubles that occur under production conditions and should call these to attention, so that they can be corrected. Future designs for similar tools can then be modified to overcome the troubles.

Operating troubles involve further losses for the plant in production delays and a less efficient utilization of equipment. Control of these troubles through more careful, accurate die setting and better die design and construction tends to improve the morale and efficiency of the press operators.

Safety is necessarily a prime consideration in

punch press work, and the die setter holds a prominent position as a key safety man. It is his responsibility to mount proper guards to provide maximum protection with a minimum of interference of the operator. Primary instruction in safety practices and operating methods can best come from him to the press men.

Most shops have no established routine for the training of personnel in die setting procedures. Quite frequently, press operators who have set up dies for themselves are designated as die setters. Their experience then becomes a matter of picking up sufficient information to enable them to carry on their work. This information is usually obtained from other die setters who also have had little or no special training in this work.

An organized program for instructing personnel in die setting provides the best means of insuring against losses due to improper setup. Such a program should include both instruction and practice on a number of points, including the following:

I—General Theory of Presses and Dies—

Principles of every type of press and die used in the particular shop should be covered, with emphasis on both proper and improper conditions. For example, if the die setter understood the purpose and function of die clearance on cutting dies, he would have more incentive for being careful in his setups to ascertain that this clearance was evenly divided around the die contour. Again, if he understood that excessive pressure on a bottoming type of die contributed nothing to the accuracy of the punching, but would damage the press and/or die, he would be more on the alert to avoid this condition in his set-ups.

II—Clamping Theory—Include proper and improper clamping procedures. Punch holders held to the press ram by shanks only must be pressed tightly against the ram face and securely fastened before clamping the lower member. Those bolted to the ram should have these bolts securely tightened, while the lower die member is free to adjust itself to any movement of the punch holder during the bolting process. The lower member can then be clamped.

Only substantial bolts, clamps and clamp supports should be used. All the clamps on a die member should be lightly drawn up before any of them are tightened.

III—Setup of Press Attachments—In setting up mechanical feeds, use and adjustment of material guides; adjustment of material movement; release of the material by the feed fingers or rolls to allow final and accurate positioning by the pilots provided in the die should be understood. The principles of air, hydraulic and spring cushions should be studied. Caution must be exercised that all pins between the cushion and the die pressure plate are of equal length, and the proper method of adjusting pressure of each type of cushion should be known.

IV—Setup of Press Work Area—In order to obtain maximum efficiency on certain types of

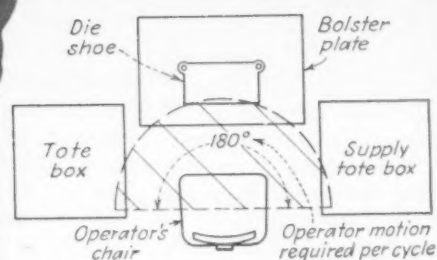


FIG. 5—This is an inefficient work place setup for small work. A 90° motion of each hand is required to manually feed and remove the punching from the die. Such setups may cause needless operator fatigue, with slow press operation.

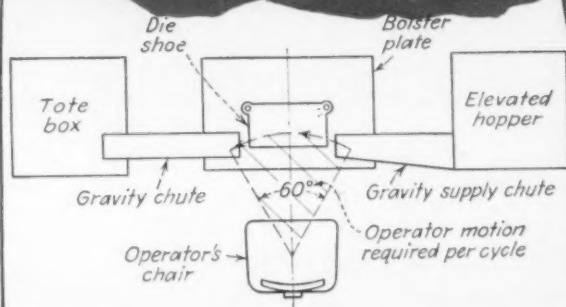


FIG. 6—In this work place setup for small work, only a 30° motion of each hand is required. Parts are carried to the feeding station by gravity chute from a hopper, or by conveyor. Drop delivery may be effected by gravity chute. Such setups permit maximum speeds and reduce operator fatigue.

jobs, special consideration must be given to the setup of the work place area. The placing of the material supply and the manner in which the material is removed from the die become important.

The operator's motions should be limited, as far as possible, to the simpler man-motions, such as those involving finger, wrist, lower and upper arm. The use of properly located supply racks and conveyers is important. The operator should not be required to bend over or turn around to reach for a new part or to put down the completed part, if it can be avoided. Such an inefficient work place setup is shown in fig. 5. When a satisfactory work area setup has been made for a particular job, the die setter must be able to duplicate it whenever the same or a similar job is set up in the future. A typical satisfactory work place setup is shown in fig. 6.

V—Safety Practices—Since the die setter

can be considered as a key safety man, he should be given intensive and repeated instruction in safety practices. Careless and hurried setups should not be tolerated in modern punch press practice, because they are responsible for a large portion of press and die maintenance. An adequate training program, planned to suit each individual shop condition, will readily pay dividends in the form of more economical punch press operation.

Among the particular advantages which could result are reduced press maintenance costs, reduced die maintenance costs, increased die life, particularly on cutting dies, minimized scrap losses by reducing the quantity of bad punchings produced and effecting best material utilization, more trouble free press and die operation, reduction of production delays, improved safety record, improved employee relations, and improved morale and efficiency of employee.

Joining of High-Strength Aluminum

THREE approaches to the improvement of welded joints in high-strength aluminum: (1) The development of improved filler metal; (2) effects of various heat treatments, and (3) the use of unorthodox joining methods including cold pressure welding, have been under investigation. While work on the two first approaches remains far from complete, promising leads appear to have been uncovered. Unorthodox welding techniques, such as cold pressure welding, have not yet seemed to offer definite hope for improving the quality of such joints.

As part of the study carried out by Battelle Memorial Institute for the Dept. of the Army, determinations were made of the strength properties of joints in thick high-strength aluminum alloy plates, welded by conventional processes with currently available filler materials.

Conventional welded joints were found to have only from 5 to 30 pct of the ductility of the par-

ent plates, emphasizing the need for filler-rod alloys that will deposit more ductile weld metal. "Alcoa 716" filler rod showed superior results to those obtained with 43S filler rods or alloys of identical composition to the parent metal.

Tensile efficiencies of welded joints were found markedly improved by full heat treatment. No work has been done yet to determine possible advantages of mechanical working welds to improve joint efficiencies.

The results of these investigations are published under the title: "Investigations on the Welding of High-Strength Aluminum Alloys," PB92831, and can be obtained in photostat form for \$8.75 or in microfilm form for \$3. Orders should be addressed to the Library of Congress, Photoduplication Service, Publication Board Project, Washington 25, accompanied by check or money order payable to the Librarian of Congress.

Graphitic Nitralloy

An alloy possessing the properties of nitrided Nitralloy together with the added feature of easy machinability is described in this article. The composition of this aluminum-chromium-molybdenum alloy, called Graphitic Nitralloy, offers flexibility in that a range of physical properties and combined carbon:graphitic carbon ratios can be obtained. The author discusses the metallurgical characteristics of this interesting metal and indicates the correlation between physical properties and microstructure.

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and
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THE success of graphitic steels for tool steel applications in industry suggests the possibility of evolving composition amenable to nitriding. An investigation was recently conducted, resulting in the development of a steel composition that can be partially graphitized by a simple heat treatment, and nitrided to possess the properties of nitrided Nitralloy, along with easy machinability. An interesting feature of

this new alloy, called Graphitic Nitralloy, is that the graphite particles serve as a lubricant, or in case they become dislodged, the microscopic pits serve to retain oil. Service results, especially in seal ring applications, support these claims. In an alloy of this type, containing aluminum, chromium and molybdenum as alloying elements, particular care must be exercised to adjust the amounts of silicon and aluminum (as the graph-

TABLE I							
Physical Properties Obtained With 6-lb Heat of Graphitic Nitralloy							
C	Mn	P	S	Si	Al	Cr	Mo
1.17	0.52	0.016	0.011	1.26	1.35	0.22	0.23
Sample No.	Heat Treatment		Hardness, Rc		Graphitic Carbon, Pct		
1	1650° F.—1 hr. oil quench, 1375° F.—5 hr.		9.5		0.06		
2	1650° F.—1 hr. oil quench, 1375° F.—10 hr.		9.5		0.91		
3	1650° F.—1 hr. oil quench, 1375° F.—16 hr.		7.3		1.01		
4	1650° F.—1 hr. oil quench, 1375° F.—20 hr.		6.9		1.13		
Sample No.	Y. P., Psi		T. S., Psi		Percent Elong. (2 in.)		
1	72,000		91,000		18.9		
2	69,500		86,500		19.3		
3	68,400		83,700		19.5		
4	67,400		83,400		18.5		

TABLE II					
Physical Properties Obtained With 40-lb Heat of Graphitic Nitralloy					
C	Mn	Si	Al	Cr	Mo
1.31	0.53	1.20	1.49	0.43	0.29
Sample No.	Heat Treatment		Hardness, Rc		Graphitic Carbon, Pct
1	1650° F.—1 hr. oil quench, 1375° F.—5 hr.		19		0.79
2	1650° F.—1 hr. oil quench, 1375° F.—10 hr.		17		0.94
3	1650° F.—1 hr. oil quench, 1375° F.—15 hr.		15		0.94
Sample No.	Y. P., Psi		T. S., Psi		Percent Elong. (2 in.)
1	84,000		108,500		17.5
2	72,800		100,500		17.9
3	71,500		97,800		16.5

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FIG. 1—Photomicrograph of the longitudinal section of sample No. 1, table II. Total carbon—1.31 pct; graphitic carbon—0.76 pct. Unetched. 100X.

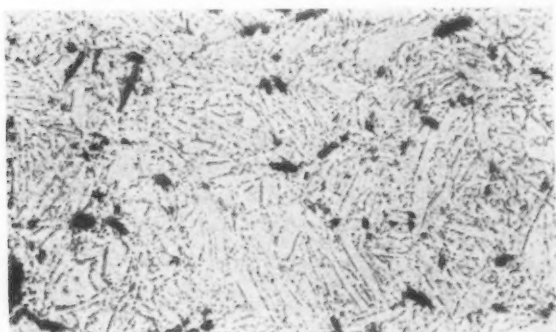


FIG. 2—Same as fig. 1 except that specimen has been etched in Nital and the magnification is 500X.

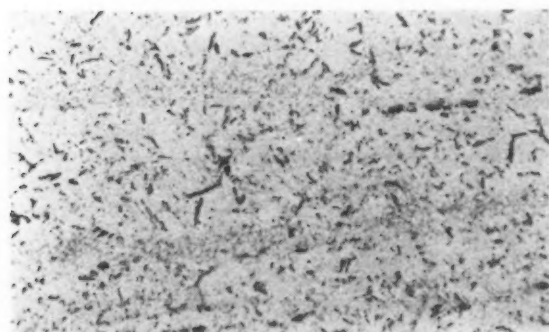


FIG. 3—Photomicrograph of the longitudinal section of sample No. 2, table II. Total carbon—1.31 pct; graphitic carbon—0.84 pct. Nital etch. 100X.

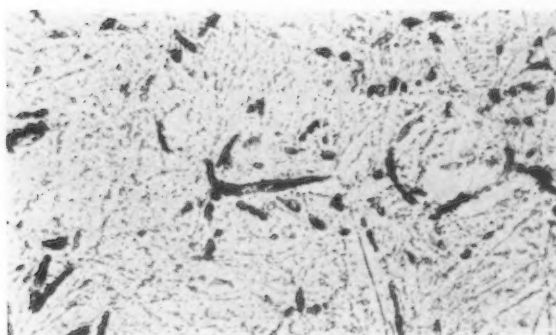


FIG. 4—Same as fig. 3 except that magnification is 500X.

itizing elements) against chromium and manganese (which are carbide stabilizers), in order to achieve the desired microstructure in the heat-treated product. Also, the composition has to possess satisfactory nitriding characteristics.

In the study described in this article, some 33 different compositions were made in an induction furnace. Preliminary data were obtained from small ingots weighing about 6 lb each; selected compositions were made in larger amounts, approximately 40 lb. The ingots were forged into $\frac{1}{2}$ -in. square bars at a temperature not exceeding 1950°F. Specimens were examined in the as-forged state, and after quenching in oil from 1650°F and tempering at 1375°F for 5 hr. This heat treatment was selected after a preliminary investigation had been made to determine the best quenching and tempering temperatures to provide the desired microstructure. The depth-hardness characteristics were determined after nitriding for 48 hr at 975°F.

As a result of the preliminary investigation the composition range selected as the most suitable one for nitriding is: 1.25-1.50 C, 1.25-1.50 Si, 0.40-0.60 Mn, 1.00-1.50 Al, 0.20-0.40 Cr, 0.20-0.30 Mo.

The carbon was in the combined state in the as-forged condition. After oil quenching from 1650°F and tempering at 1375° to 1400°F, the combined carbon was reduced to 0.30 to 0.50 pct. The remainder of the carbon was in the form of temper carbon.

Such a structure is amenable to further heat treatment after rough machining if a higher tensile strength is required. Reheating to 1500°F, followed by oil quenching and then tempering at 1000° to 1300°F will increase the hardness and tensile strength over those provided by the graphitizing treatment.

In order to investigate the mechanical properties of Graphitic Nitralloy, two heats, one of 500 lb and one of about 1000 lb, were made. Table I shows the results obtained with the smaller heat. Bars of 1-in. and 2-in. diam, were heat treated by oil quenching from 1650°F and tempering at 1375°F, and were then machined into standard 0.505-in. diam tensile specimens.

Table II gives the results obtained with the

TABLE III

Effect of Heat Treatment on Hardness and Carbon Distribution of a 22-ton Openhearth Heat of Graphitic Nitralloy

Treatment	Brinell Hardness	Total Carbon	Graphitic Carbon	Combined Carbon
As rolled (1 in. diam.).....	363	1.26	0.02	1.24
Oil quenched from 1650°F; tempered at 1375° F for 10 hr.....	229	1.24	0.66	0.58
As rolled (2 in. diam.).....	363	1.24	0.01	1.23
Oil quenched from 1650°F; tempered at 1375° F for 5 hr.....	207	1.20	0.77	0.43

larger heat. Bars, 1 in. in diam, were quenched from 1650°F and tempered at 1375°F, after which they were machined into standard 0.505-in. diam tensile specimens.

Longitudinal sections were prepared from the tensile specimens reported in table II for microscopic examination in order to observe the size, distribution and form of the graphitic carbon as well as the character of the matrix.

Figs. 1 and 2 show in the unetched specimen at 100X and the etched specimen at 500X, respectively, an excellent distribution of small graphitic carbon (temper carbon) areas. Fig. 2 shows also a finely spheroidized matrix. Similar structures are shown in figs. 3 through 6.

A specimen for depth-hardness determinations was quenched in oil from 1650°F and tempered at 1375°F for 5 hr after which it was nitrided for 48 hr at 975°F. The results are shown in fig. 7. The nitriding characteristics are very satisfactory.

Subsequent to the investigations reported above, a large heat of 22 tons was made by the acid openhearth process. This heat was rolled into sizes varying from ½ to 4 in. in diam. The composition of the heat was as follows: 1.26 C, 0.49 Mn, 0.028 P, 0.024 S, 1.14 Si, 1.11 Al, 0.29 Cr, 0.22 Mo.

The thermal critical points as determined dilatometrically at heating and cooling rates of 400°F per hr were as follows: A_c —1450°F, A_c —1480°F, A_r —1375°F, A_r —1340°F.

Tables III and IV give the composition and mechanical properties of specimens prepared from bars of this heat.

The author acknowledges his indebtedness to Bethlehem Steel Co. for the data, covering the large heat, given in tables III and IV.

The results given show that the carbon is entirely in the combined state in the as-rolled condition and that the graphitizing treatment of oil quenching from 1650°F followed by tempering at 1375°F gives uniform results for the various sizes, as shown in table IV.

o o o

Diam. of Bar, In.	Total Carbon	Graphitic Carbon	Comb. Carbon	Yield Point, Psi	Tensile Strength, Psi	Elong. in 2 in., Pct	Reduction of Area, Pct
½	1.18	0.68	0.50	68,000	98,000	21	37
3	1.27	0.72	0.55	68,500	97,000	20	31.5
4	1.28	0.77	0.51	69,000	98,500	22	37

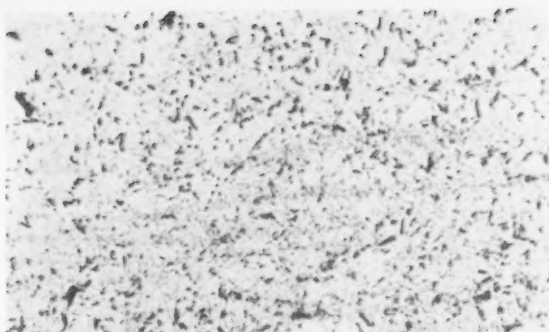


FIG. 5—Photomicrograph of the longitudinal section of sample No. 3, table II. Total carbon—1.31 pct; graphitic carbon—0.84 pct. Nital etch. 100X.

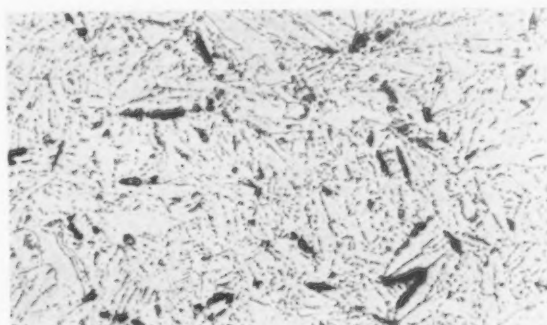


FIG. 6—Same as fig. 5 except that magnification is 500X.

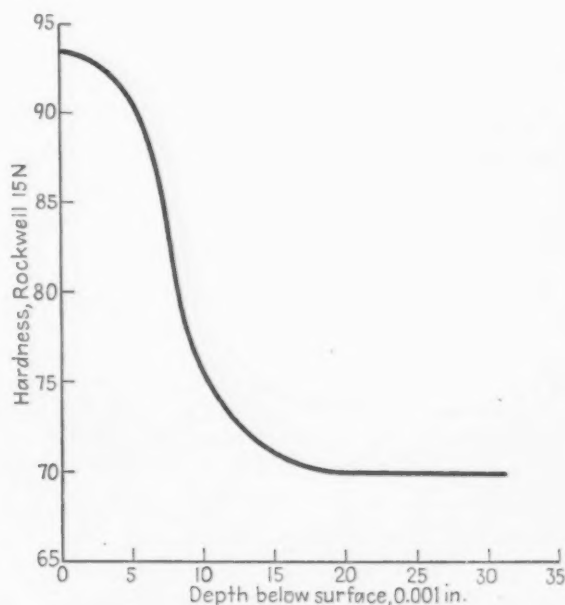


FIG. 7—Hardness v. depth below surface of sample No. 1, table II. Heat treated at 1650°F for 1 hr, oil quenched, 1375°F for 5 hr, nitrided 48 hr at 975°F.

o o o

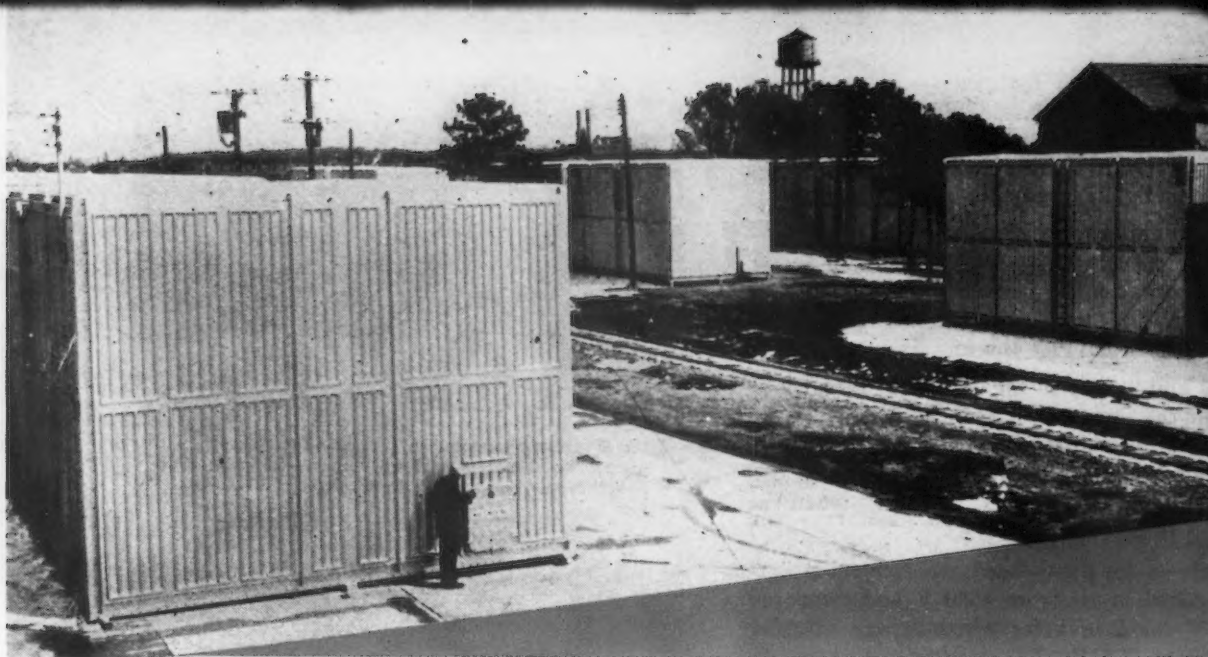


FIG. 1—Containers for future Naval aircraft kept in fly-away condition in containers such as these. Sections are being made by Goodyear Aircraft Corp., Akron, for six Naval storage depots. The units are made in two sizes and each section of the container requires more than 100 ft of machine welding.

Welding Aircraft

MASS production tools and techniques are used by the Goodyear Aircraft Corp., Akron, for making giant steel containers shown in fig. 1 to store Navy airplanes in a fly-away condition. In the large plant, where during the war were made the planes now to be stored, top, bottom, side and end sections of storage containers are being fabricated. The sections are shipped flat to storage sites where they are erected into units 19 x 140 ft or 24 x 130 ft. By using straight-line production methods, an average output of 2½ containers per day has been maintained. Three railroad flat cars are required to transport one complete container or can.

The various container sections are made by welding special corrugated sheet steel panels to frames of angles and channels. To assure an airtight, moisture-proof container, all welds joining the panels are continuous, made with Lincolnweld automatic heads manufactured by the Lincoln Electric Co., Cleveland. Each section requires over 100 ft of machine welding, and to provide for a continuous flow of sections through this welding operation, seven welding stations have been set up. Each station is arranged so that while the automatic head is welding one section, another section is being put into a fixture. Welding continues uninterruptedly. The seven stations turn out over 3 miles of welds per day.

Traveling gantries for mounting the welding

heads as well as all other jigs and fixtures were designed and made by the Goodyear Aircraft Corp.

The overall layout of the operations is seen in fig. 2, which shows four of the seven automatic welding stations. The finished panels are seen in the left foreground ready for painting while the frame assembly operations are going on in the background. The monorail overhead cranes move the work in a continuous flow through the various stations.

All parts are degreased in lift racks and taken in those racks directly to the welding stations. The first welding stations are the frame assembly fixture. Shown in fig. 3 is a side section frame made of two 3 x 5 in. channels for the longitudinal sides, two 3 x 4 in. angles for the ends, one center transverse Z bar, and four longitudinal Z bars.

All members are first tack welded, three or four operators working at one time on the frame. After tacking, it is finished welded, all joints being welded in the flat or vertical down position. The frame is then turned over for welding on the opposite side. All facing surfaces are ground flush and the frame is then hoisted and placed in one of the gantry fixtures for welding on the corrugated metal skin.

The sheet metal panels are 8 2/3 x 3 1/6 ft and made of 14-gage, pickled and oiled, cold-rolled steel. The special corrugation is pressed in by

High-speed production was the primary interest in laying out the welding and assembly line at Goodyear Aircraft Corp., Akron, for building air-tight containers for storing Navy aircraft in fly-away condition. Automatic welding heads, gantry-mounted, weld skins to frames at a speed of about 8 fpm, completing 2½ containers a day. The welding methods are described in this article.

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Storage Containers . . .

the Youngstown Steel Door Co., Youngstown, where the panels were first developed for box car doors. As with the angles and channels, the panels are first degreased in racks and carried to the welding stations in the racks.

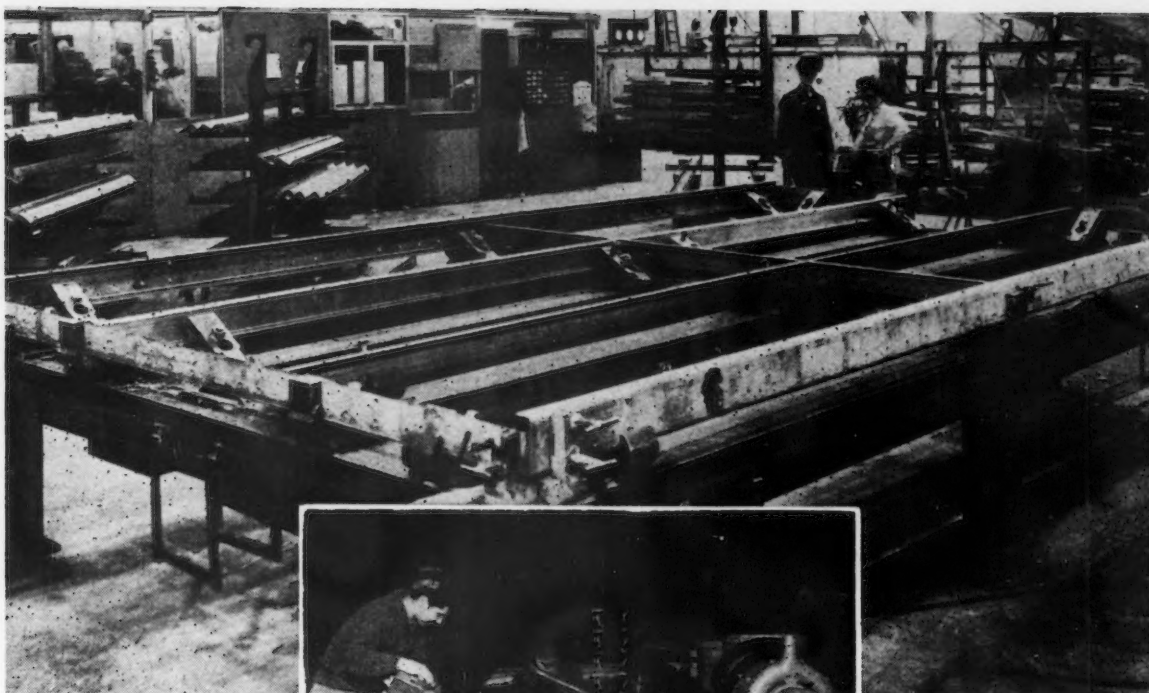
The butt lines for locating the position of the

sheet metal panels on the frame are marked on the frame with chalk lines. A chalked string is stretched between fixed locators on the sides of the jig.

The skins are placed matching the lines and tack welded. Continuous welds are then made

FIG. 2—The gantry-mounted welding head in the foreground is welding a side section, while the fixture between the tracks to the right is being readied for another section. Four of the seven automatic welding stations are shown.

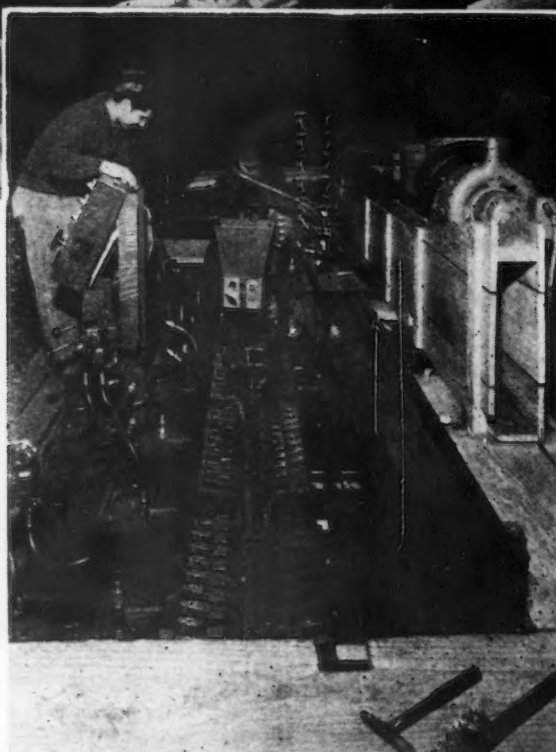




ABOVE

FIG. 3—Frames, consisting of angles, channels and Z's, are first tack welded. Finish welding is done by hand in the flat position, then the frame is overturned for welding on the opposite side. This is a side section.

o o o



LEFT

FIG. 4 — In making a transverse weld, across corrugations of the container skin, the skin is clamped by air-operated arms. The welding head is mounted on a carriage on the gantry so that the head is driven on a beam by its own carriage motor while the gantry is stationary.

o o o

with the gantry-mounted automatic welding head, each weld requiring positioning of the gantry. Air-actuated clamps pushing against the 5-ton weight of the gantry hold the skin down during the welding. In making the longitudinal welds, during which time the gantry moves the length of the section, roller clamps ride along the seam. In making the transverse welds, the skin is clamped by a series of air-operated arms as shown in fig. 4. The welding head is mounted on a carriage on the gantry so that when the gantry is stationary for the transverse welds, the head is driven on a beam by its own carriage motor. The controls are interlocked so that the carriage can only move when the clamping arms are down. The carriage remains stationary on its beam when the gantry is moved in making the longitudinal welds.

All controls for the complete operation of the gantry and welding head are mounted on a central panel on the bridge of the gantry. The vac-

uum units for picking up and reclaiming flux are mounted on the gantry, as are the 600 amp welders. The dc circuit controls of the automatic welding head simplify the relaying of this centralized control panel and permit relatively inexperienced operators to easily position the head over the seam and adjust the electrode up or down to start the arc. This automatic welding head does not require any additional fusing material to aid in starting the arc.

A welded side section is shown in fig. 5. Seven machine welds are made on this section, three of which are transverse welds—one on each end and one in the middle. Four of the welds are longitudinal, two along the sides and two down the middle. All welds around the outside of the panels are made $\frac{3}{8}$ in. from the edge of the sheet metal with the welding-through technique. Welds are made with currents from 525 to 560 amp with a $\frac{1}{8}$ -in. diam electrode. The high current densities concentrate sufficient heat to weld

FIG. 5 — The finished side panel is shown here, inspected and ready for painting. Automatic welding produces the finished containers at the rate of $2\frac{1}{2}$ a day.



through the sheet metal, fusing it directly with the channel member beneath. Speeds of travel are from 88 to 96 ipm. All welds are made against a copper chill strip mounted on top of the supporting members of the jig. The two inside longitudinal welds and the one transverse weld are made over the plain butt joint between panels, and the weld both joins the panels and fuses them to the Z-bar members beneath.

Distortion is controlled and the sections are finished straight within $1/32$ in. The uniform application and high concentration of the welding heat, plus the fast travel speeds, eliminate much of the distortion. Firm clamping in the fixture further contributes to this control, plus the following of a balanced sequence in making the welds. All welds are made away from the ground.

The first weld made is a transverse weld on one end of the section, moving from left to right on

the gantry. The head is then positioned to make the outside longitudinal weld. This brings the gantry to the opposite end of the section where the other end transverse weld is made, running the head on the beam from right to left.

The gantry is then run down without making the weld along the left-hand inside seam to check the alignment of the butt joint of the panels. The two inside butt seams are then welded; then the middle transverse joint, and finally the left-hand outside longitudinal through-weld. This sequence effectively controls shrinkage during the welding. The final operations are 100 pct inspection of all welding and painting.

This production of storage containers is being speeded to a conclusion at the rate of $2\frac{1}{2}$ units per day to provide the Navy with containers to store 2000 aircraft of all types. Planes will be stored at six Navy bases throughout the country.

German Oxygen Generating Plants

A NUMBER of the different oxygen generating systems used in German industry are described in a report now available from the Office of Technical Services, Dept. of Commerce, Washington.

Equipment of the Messer Co., chief German manufacturer of plants of other than Linde-Frankl design is discussed, and information on the Heylandt Process, the Kapitza (Russian) process, operation at low pressures only, the acetylene hazard in the various systems and physical constants of the gasses is given. The successful use of silica gel adsorbers in re-

moving acetylene and other hydrocarbons is described.

According to the report, the experience of German users of oxygen in quantity indicated that, while the production of oxygen in purities up to 99 pct requires rapidly increasing amounts of energy, manufacture in concentrations of less than 95 pct was not economical.

The report, PB-88840, contains 124 p. and costs \$3.25. Orders should be accompanied by check or money order payable to the Treasurer of the United States.



Fig. 1. Buffing machine used with a coarse grit wheel to remove draw marks and other irregularities before delivery to the plating department.

Mass Production Techniques

Rapid, systematized operations for polishing and plating steel auto parts at the Brown-Lipe-Chapin Div., General Motors Corp., are described in this article. Procedures in the automatic cleaning and plating lines are discussed.

POLISHING and electroplating operations at the Syracuse plant of Brown-Lipe-Chapin Div., General Motors Corp., have been geared for large quantity production of bumper guards and other steel parts for General Motors cars and trucks.

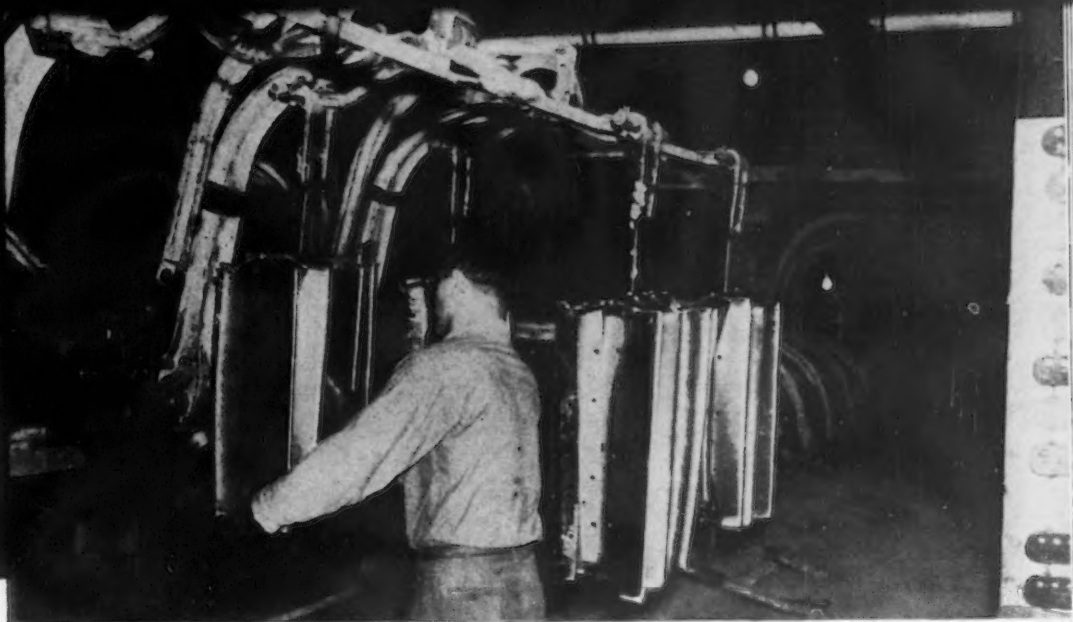
Nearly all the parts processed are for severe exterior exposure and must meet decorative plating specifications as well as functional needs.

Parts are initially formed from cold-rolled steel and generally require considerable polishing to remove draw marks and other irregularities before delivery to the plating department. For example, bumper guards must first have ends ground on a coarse grit belt, running over a 16-in. diam scrap buff at 1750 rpm, as in fig. 1. And then must be polished on a cement-headed, fine grit wheel and given a final polish on a fine grit, glued wheel with grease stick application.

All or nearly all surfaces of parts are ground or polished before the parts are delivered to plating departments.

No buffing is done until after the first coat of copper has been applied, as buffing is more rapidly and more easily done on the copper and causes the metal to flow and fill or mask scratches left by polishing wheels.

Initial copper plating is done on a Stevens plating machine, part of which is shown in fig. 2, using Butanol-coated racks making about 1.1 cycles per hr through the machine. The process



in Plating Steel Auto Parts

begins with dip cleaning in an alkaline solution at 170°F, followed by reverse electrolytic cleaning in an alkaline solution at 212°F.

Parts then proceed to a cold spray rinse, an etch in dilute sulfuric acid at room temperature and another cold spray rinse. The next step is a cyanide copper strike to prepare the parts for bright copper plating. In the bright plate bath, an average of 0.0008 to 0.0009 in. of copper is applied in 23 min, using a current density of about 30 amps per sq ft.

This plating is followed by two cold spray rinses after which racks are removed from the Stevens machine and are hung on a chain conveyor that takes them to an unranking station for subsequent buffing. Some parts are hand buffed, but Chevrolet parts, handled in largest quantities, are buffed on a straight line machine in which parts are placed in fixtures for advancing by chain under a series of ten wheels. Some of the wheels are fed with a fine spray of liquid compound. Stick compound, fed automatically, is applied to the other wheels. Hand buffing on areas that the conveyor line wheels do not reach is necessary on some parts.

After buffing, parts are fixed to a different set of racks for additional copper and nickel plating. Threaded portions of the parts are covered with short lengths of rubber tubing to prevent plating of the threads.

An additional coating of bright copper, partly

FIG. 3—Steel parts that have been copper and nickel plated emerging from final rinse before chrome plating.

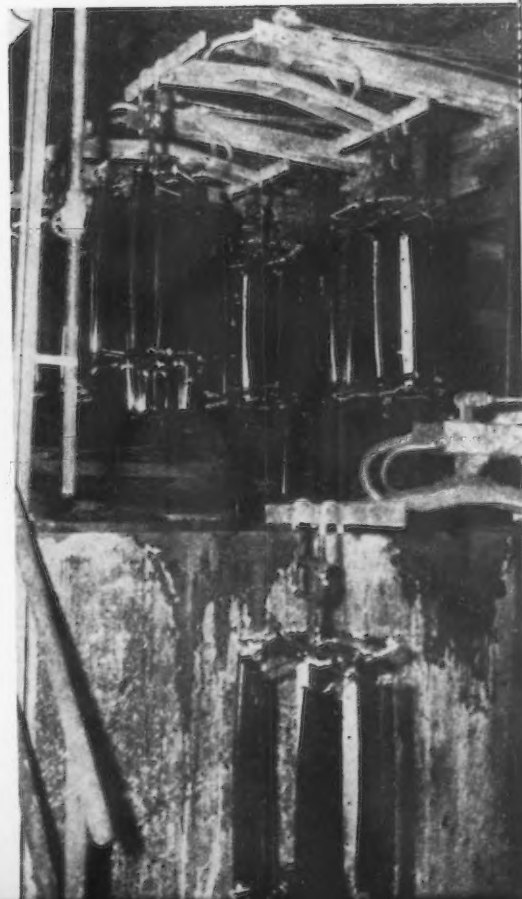




FIG. 4—Racks of bumper guards emerging from the drying oven at the end of the plating line.

to replace the copper buffed off, is applied prior to nickel plating. This operation is done on a Hanson-Van Winkle-Munning machine which also does the nickel and chrome plating. The schedule through the machine is as follows:

(1) Dip clean in alkaline solution at 180° to 200°F. (2) Dip clean in a second alkaline solution. (3) Electroclean in an alkaline solution at 200°F. (4) Cold spray rinse. (5) Electroclean as in step (3). (6) Rinse. (7) Etch for one min in a weak sulfuric acid solution at room temperature. (8) Rinse. (9) Copper strike in cyanide solution at 120°F. (10) Bright plate 0.0004 in. of copper for a total average copper thickness of about 0.001 in. (11) Dip rinse and cold spray rinse. (12) Electroclean in an alkaline solution at 150°F using case-hardened steel

anodes. (13) Cold rinse. (14) Dip in weak sulfuric acid solution at room temperature.

(15) Bright nickel plate in a proprietary solution containing nickel chloride, nickel sulfate, boric acid, a brightener, and both wetting and antipitting agents. Bath pH is held at 3.5 to 4.0, and temperature is maintained at 130°F. This plating is done with bagged anodes in a rubber-lined tank and continues for 20 min to give an average of 0.0006 to 0.0008 in. of nickel. Current density ranges from 20 to 45 amps per sq ft. Arms, supporting the racks are agitated, and the solution is continuously circulated and filtered. (16) Dip rinse in reclaim tank. (17) Dip rinse two more times, after which parts enter the chrome plating line. (18) Cold spray rinse. Fig. 3 shows racks at final rinse before chrome plating.

(19) Chrome plate in standard solution at 110°F using sawtooth lead anodes.

Voltage is adjusted to suit the rack loads in the tank, with current density varying from 250 to 350 amps per sq ft. (20) Dip in reclaim tank in which water is violently agitated. (21) Cold dip rinse in agitated tank equipped with spray. (22) Cold dip rinse, air agitation. (23) Hot spray rinse. (24) Advance through a drying oven heated with steam coils and with forced air circulation. Fig. 4 shows racks of parts emerging from the dryer and being unloaded onto a chain conveyor to be carried to an unranking station. Racks are stripped before being reloaded for the next circuit.

Inspection of the plated parts for defects and lack of coverage is done at the unranking stations. Any parts that show burns are buffed on those areas, but no other buffing is required.

Ceramic Coatings Protect High Temperature Metals

BECAUSE requirements of stress and temperature for performance beyond the potentialities of currently used high temperature alloys, the National Bureau of Standards under the sponsorship of the National Advisory Committee for Aeronautics have undertaken investigations toward the development of ceramic coating for metals with high melting points. The work has been directed toward the prevention of oxidation at high operating temperatures. Preliminary results indicate that molybdenum with specially designed ceramic coatings is promising.

The coatings are applied in the form of water suspensions or "slips" to cleaned specimens by

either dipping or spraying. After drying, the pieces are fired at 2150°F in oxygen-free atmosphere.

One of the better coatings, M-13-33, consisted of a base coat of low expansion frit with 20 pct zirconia added, a cover coat of 95 pct zirconia and a seal coat of a thin application of the base.

The best of the coatings retarded oxidation of the molybdenum. In air at 1650°F, unprotected molybdenum sheet decreased 0.02 in. in thickness in ½ hr, but there was no decrease for the ceramic coated molybdenum heated for 70 hr under the same conditions.

Hot Forming Magnesium Sheet

By E. F. STONER,
and
CROSBY HARDEN

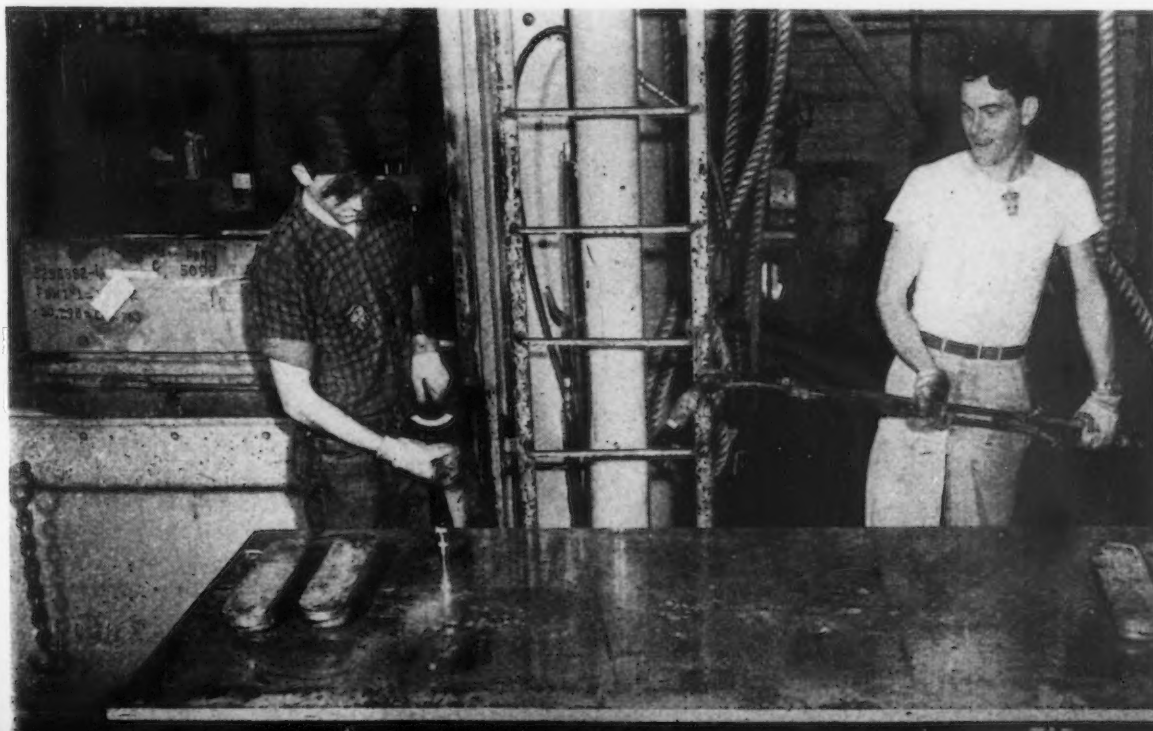
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Results of investigations of various methods of hot forming magnesium sheets, with particular emphasis on forming limitations, methods of heating and heat ranges are discussed in this article. Chief conclusion reported is that hot drop hammer and stretch press forming offer distinct production advantages.

THE lack of information on the service performance of magnesium alloys under all conditions of aircraft operation is a limiting factor in their consideration. For this reason, it appears that the initial use of magnesium alloys could be for a few non-critical, replaceable parts to gain design, production and service experience. If this experience is favorable, their use could be gradually increased where justified.

Magnesium has been used to a limited extent in planes built at the El Segundo plant of Douglas Aircraft Co. The most interesting applications were the fuselages of the Navy-Douglas Sky-streak and its sister ship, the Skyrocket. Here the use of a relatively thick magnesium skin eliminated the need for longitudinal stiffeners, and the transverse frames were widely spaced and of relatively small depth since they did not need to allow for passage of the longitudinal stringers. This smaller depth in turn permitted a smaller outside diameter for the fuselage, an important aerodynamic advantage. The relative simplicity of the fuselage structure also made it easier to assemble. Magnesium has also been used as a space-saver in the wheel compartments in thin wings. The usual skin-stiffener wing covering over the wheel wells is replaced by a thick unstiffened sheet of magnesium alloy, gaining space for retracting the wheels out of the air

FIG. 1—This heating plate setup shows the heating method and pyrometer used for temperature readings.



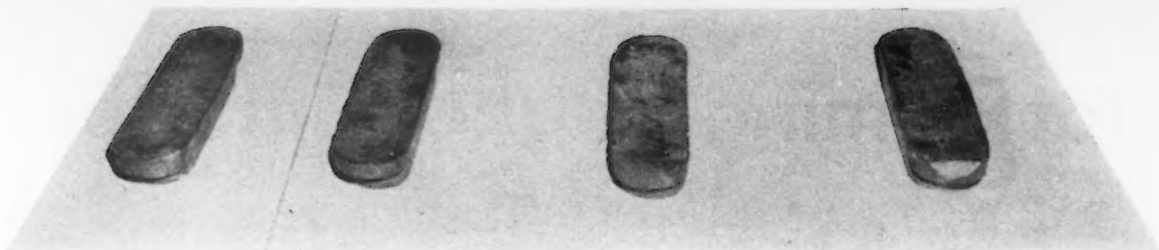


FIG. 2—Asbestos held in place by lead pigs, is used to cover the heating plate and sheet.



FIG. 3—Typical drop hammer formed part.

stream. Magnesium castings and extrusions are used where the weight saved justifies their use.

Applications of magnesium alloy sheets will eventually involve drop hammer forming. Since the El Segundo plant had not had previous experience with the hot drop hammer forming of magnesium, tests were conducted to determine the forming limitations, best methods of heating, proper heat ranges, and other factors that would influence design, tooling and production.

Magnesium alloy FS-1 in both the annealed

(FS-1a) and the hard rolled (FS-1h) conditions was selected for the tests. FS-1a can be formed at temperatures as high as 650°F without affecting its strength, but FS-1h loses strength when formed at temperatures above 325°F. However, because most material on hand was FS-1h and since interest was primarily in forming limits, tests on both the annealed and hard rolled materials were conducted at temperatures up to 600°F. Gages tested ranged from 0.040 to 0.125 in.

The tests were run with a minimum of expense, thereby precluding the use of special tooling or equipment. The first problem was to provide a suitable method of heating the magnesium sheets quickly and uniformly. The heating was to be done close to the drop hammer so that the sheets could be transferred quickly to the hammer with a minimum heat loss. For this purpose a thick metal slab having a flat, smooth surface was used, and heated with gas-air torches, as shown in fig. 1. Kirksite was tried for the slab, but was found to soften locally at about 475°F. Hence, an aluminum slab was used since temperatures exceeded 650°F. Tempil sticks were first used to measure temperatures but were awkward. A surface pyrometer was obtained and proved highly satisfactory. After the slab had been uniformly heated to the test temperature, the magnesium sheet to be formed was placed on it, then covered with asbestos sheet and weighted with lead pigs to hold it tight against the heating slab, as shown in fig. 2, insuring uniform and rapid heat transfer.

The dies used for the tests were selected from production dies to represent the most severe conditions anticipated in the applications being considered, such as deeply pillowed double curvature inner skins for doors and cowling. A typical part is shown in fig. 3 and the die in place on the hammer in fig. 4. The dies had Kirksite bottoms and lead tops. The die bottoms were heated in place, using gas-air torches, a slow but effective method for experimental work. Dies required an hour or two to reach temperature. This time could have been reduced had

FIG. 4—For testing hot forming of magnesium, the die bottom is in place on the drop hammer.



some insulation been used between die bottom and press bed. Highest temperature of the Kirksite die bottoms obtainable without excessive local softening was approximately 475°F. To obtain highest possible temperatures of the lead top, a new top was poured prior to the first tests and the top used as soon as it had solidified sufficiently. By the time the test hits were made the maximum die top temperature was less than 300°F. However, it was obvious that die top temperature was not critical for normal impact forming since the time of contact with the sheet during forming would only be a fraction of a second.

Dies were heated to maximum possible temperature in order to try a method of slow forming. The die selected for these tests was the final one of five staging dies required for the forming of the aluminum part shown in fig. 5. It was anticipated that the magnesium part could not be formed completely in one strike, but that it might possibly be formed on the single die by letting the top form the part as far as possible under gravity, followed by an impact hit to complete the form. This method worked in all cases tried. However, it was also found that the part could be formed with one blow if the initial sheet temperature was slightly higher.

Tests were run at various combinations of die and sheet temperatures. It was found that good parts could be impact formed in all the test gages of FS-1a and FS-1h with initial sheet temperature, at the heating plate, ranging from 450°F for the heavier gages of FS-1a to 600°F for the lightest gages of FS-1h, the annealed sheet requiring somewhat lower forming temperatures than cold-rolled sheet in the same gages.

Sheet temperature proved an important variable. Die temperature was not critical as parts were successfully formed at die temperatures as low as 130°F. However, warming the dies reduces heat loss from the sheet during the few seconds it is in contact with the die prior to striking. Heat loss from the sheet during transfer from the heating plate proved small, even in the lighter gages. Spring-back was very small. Wrinkles formed in the light gages, and it was found necessary to heat the sheet for planishing, as even the annealed material was too

hard to hand-work readily.

The excellent hot formability of magnesium exhibited on the drop hammer tests encouraged a series of tests of severe stretch press forming. Dies were on hand that had been made for an unsuccessful attempt to form bomb rack fairing nose and tail sections, each in one piece of aluminum alloy, to avoid the current practice of making them of two pieces welded together.

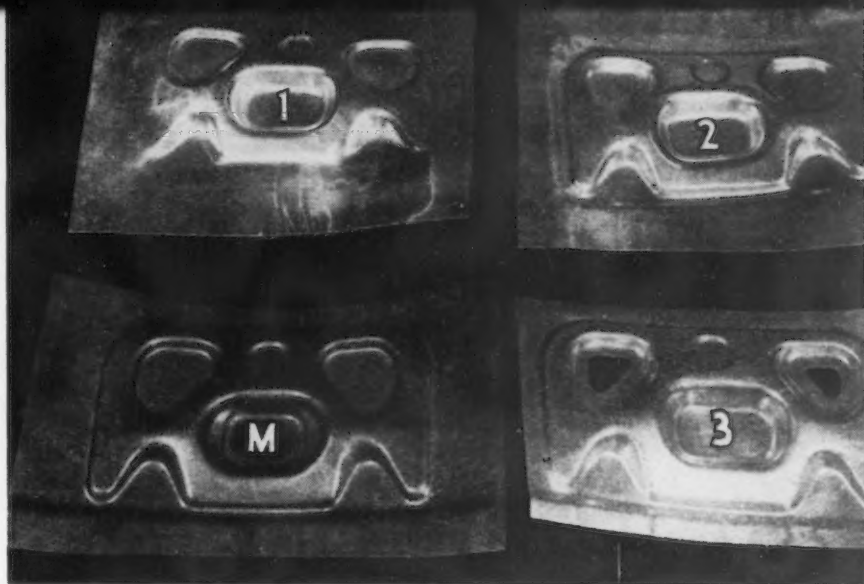


FIG. 5—Aluminum parts are stage-formed on two starter dies, 1 and 2, and completed in finish die, 3. The hot formed magnesium alloy part, M, required finish die only.

FIG. 6—This all-magnesium bomb rack fairing assembly is 25 pct lighter than a similar aluminum assembly. Parts D, B, and C were formed on a stretch press; bulkheads E were formed in a punch press; bulkheads F were formed in a drop hammer; parts E and J were formed in a Hydropress; and parts K, I and H were formed in a press brake.



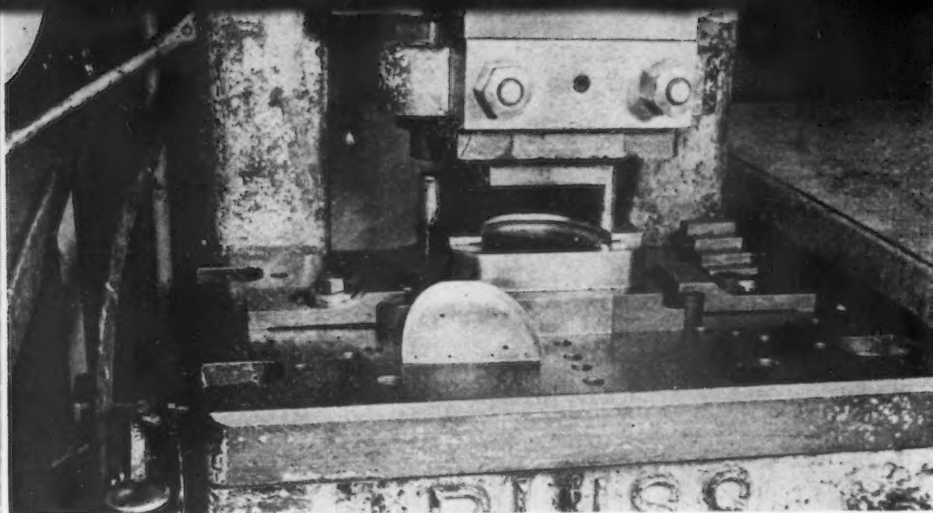


FIG. 7—This is a typical punch press forming die and a hot formed magnesium part.

The die was mounted on the press with asbestos between it and the loading bar to minimize heat transfer. The die was heated with gas-air torches and the sheet was heated on a hot plate as for the drop hammer tests. However, heating the sheets was found to be a waste of time, as the time required to place the sheet in the machine grips and perform the stretching operation was so great that the sheet cooled except where it was in contact with the die.

Sheet used for the stretch tests was 0.051 in. FS-1a and 0.040 in. FS-1h, annealed for a half hour at 600°F. Ruled on one side of each test sheet to provide a means of visualizing the stretch distribution were 1 in. squares. The dies were lubricated with Ultra Vis No. 32, a clean lubricant which maintained sufficient lubricating properties at the maximum temperatures used. Tests were run with the dies at temperatures ranging from 300°F to 600°F. Best forming temperatures were found to be about 325°F to 350°F.

Distribution of the stretching was found to be the most important and difficult factor to control. The stretching naturally tended to take place where the sheet was hottest, which occurred in the bulge area in contact with the die, and little or no stretch occurred in the sheet skirts, the portion between the grips and line of contact with the die. An attempt to relieve this situation by cutouts at the middle of each skirt helped considerably, but required care in determining correct proportions to prevent wrinkling or tearing. A different approach was then tried, that of heating the skirts. Gas-air torches were first used, but sheet temperature was too difficult to control. Banks of infrared lights were tried next, but sufficient capacity could not be obtained to reach and maintain the required temperatures. Finally, the die was recast, adding a longer skirt, to provide contact with and consequent heating of the sheet in the skirt areas. This proved quite successful and stretching was fairly uniformly distributed, permitting successful forming of the most difficult parts tried. In addition to the advantage of one piece fabrication, the shape conformed exactly to the die, resulting in an aerodynamically better part than was possible with the welded assembly.

To round out the test program, all parts for the complete bomb rack fairing, shown in fig. 6, were fabricated and assembled. This involved drop hammer, stretch press, punch press, brake, hydro press, and dimpling operations, and served to give all departments involved an opportunity to get acquainted with magnesium fabrication.

A typical punch-press die setup and magnesium part is shown in fig. 7. The dies were used cold and the sheet heated to 450°F. FS-1h sheet was used (not annealed) and formed satisfactorily.

Hydropress forming, being a relatively slow operation, required a hot form block, but no preheating of the sheet. The form block was heated off the press, then put in place on an insulating sheet to prevent rapid heat loss to the press bed. The form block and magnesium blank were covered with a rubber pad to protect the large rubber blanket in the hydropress ram. For production, special heat resistant rubber compounds are available. Parts formed satisfactorily.

Brake forming was accomplished by simply torch heating the dies and preheating the sheet.

In assembling the fairing, dimpling was necessary. It was done with the same electrically heated dimpling dies used for aluminum 75-ST. A slow, continuous application of pressure was found best, with the die heat adjusted to give a dimpling temperature between 200°F and 350°F, depending on gage.

As far as the limited range of the tests permit conclusions to be drawn, it is believed that with adequate heating equipment it is possible to form parts of magnesium alloy that can be formed of the usual aluminum alloys. However, at present it is felt that of the methods tested only drop hammer and stretch press forming will offer any distinct production advantages. The elimination of staging with the former, and the possible reduction of parts and joining operations, such as welding, with the latter may in some cases result in production savings and better parts. Costs for the other operations are expected to be higher because there appear to be no forming advantages to offset the additional heating operation and tooling charges.

The results obtained from the use of the crude heating plate test setup have served as a useful guide in designing a portable production plate type heating oven in which the sheet will be clamped between two heated platens. A portable oven for heating formed parts is also being planned to heat parts requiring additional forming or hand work.

The forming tests did not cover the complete range of problems that would be representative of full scale production with magnesium. However, they have indicated some of the factors to be considered in planning to fabricate magnesium alloys.

New Heating Furnaces Boost Forging Output

By HERBERT CHASE
New York

Introduction of new rotary hearth furnaces with full automatic controls has increased uniformity of forgings, increased capacity, and conserves both space and fuel at Transue & Williams. The use of these rotary furnaces and various forging jobs are described in this article.

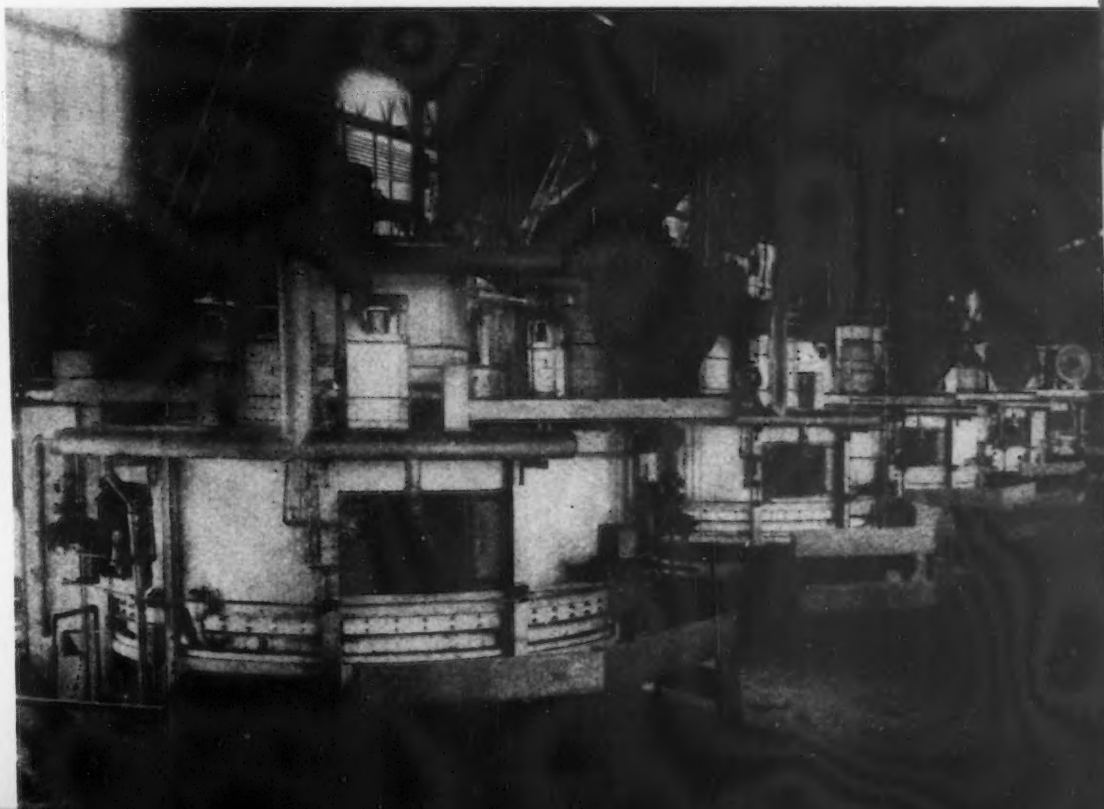
IN the constant effort to produce superior forgings with high economy, Transue and Williams Steel Forging Corp., Alliance, Ohio, has added a laboratory for control and research on steel and has installed new rotary hearth furnaces. Counted among the advantages of these furnaces, which were all built by the George J. Hagan Co., Pittsburgh, are a much higher degree

of uniformity in billet heating, plus economies in space required and in oil consumed. Average savings in oil, as compared with previous furnaces used, amounts to about 3 gal per ton of billets heated. A part of this saving is in reduced radiation losses.

Besides these economies, there is the convenience of having the billets delivered always at the same point at a uniform rate. This helps to shorten handling time. Also significant is the avoidance of the hazard of overheating steel. Precise thermostatic control of firing prevents overheating even though die changes or other delays may interfere with the regular discharge of billets as they reach the unloading station.

At the start of a given run, furnace controls are set by the shop metallurgist to suit the type and size of billets required and furnacemen are

FIG. 1—A battery of five Hagan rotary hearth furnaces, installed at the Transue & Williams Forging Corp., Alliance, Ohio, has resulted in major operating economies.



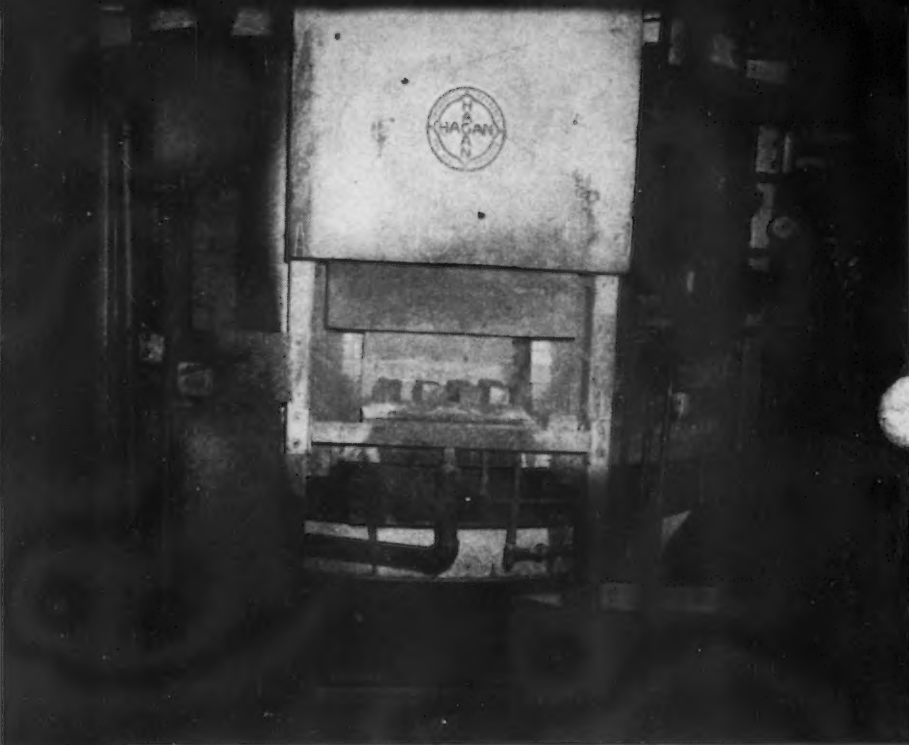


FIG. 2—Through the charging door of one of the new furnaces can be seen a part of the rotary hearth. One of the burners for using oil fuel is shown at right.

not permitted to change these control settings. If troubles arise, the metallurgist in charge must determine their cause and see that the steps necessary for their correction are taken promptly. This trained supervision, in combination with precise and properly set automatic furnace controls, is counted upon in large measure to insure uniform quality of the forgings.

Fig. 1 shows a battery of five of the new furnaces and fig. 2 shows a portion of the circular hearth through the loading and unloading door. Although the new rotary hearth furnaces replace either two or three of the type formerly used,

FIG. 3—One end of a truck axle forging and the finish forging die are shown here. After reheating, the end shown here in the tongs is forged similarly to complete the axle. Flash is trimmed in this die.



the time that billets remain in the furnaces averages 25 to 30 pct longer. This makes it possible to operate at a lower thermal head and accounts in part for the higher fuel economy and for preventing waste through overheating of steel.

Flames from burners are directed tangentially and horizontally about 18 in. above the hearth. Although the furnaces are not designed for controlled atmosphere in the usual sense of this term, burners are adjusted to maintain a slightly reducing atmosphere and thereby tend to reduce scale formation. Thermocouples are placed nearly opposite the discharge door about 24 in. above the hearths.

All hearths are 9 ft diam, except in one furnace having a 7 ft hearth. Such hearths afford large area despite the moderate size of the fur-

naces and their economy in floor space. If short billets are required, two rows, with pairs of billets set radially end to end, can be handled.

Although furnaces were designed originally to have one of the flues at the center in the belief that this was necessary to insure uniform heating, experience has shown that this flue can be eliminated, thus increasing useful hearth space, as the central flue required space for a central support no longer needed. Hearth speed is kept constant and fuel supply is varied in proportion to the tonnage rate at which billets are charged.

With the rotary furnaces, one man charges cold billets and removes those heated to forging temperature. As one furnace displaces two or three of the box type, each of which needed one furnaceman, there is a considerable saving in labor. Some consideration was given to the use of induction heating rather than heating in oil fired furnaces, but the latter are regarded as more adaptable to the constantly changing requirements of a job shop in which a variety of forgings in different types of steel must be handled.

Not all box type furnaces have been eliminated, partly because the box type is better adapted for some types of work and its average economy is being improved by the installation of automatic controls. These are designed to reduce or pre-

vent billet overheating.

Fuel economy is also bettered in part by equipping box type furnaces with doors that are adjusted to provide the minimum opening for billets of a given size.

Box type furnaces are used for most large forgings including those that require reheating, partly because this type is considered better adapted to this class of work and to the forging cycle required on certain large parts.

Typical of such work is the forging of heavy front axles of H-shaped sections except at the ends where yokes are forged. In work of this type the hammer and furnace setup is such that the heavy billets and forgings are handled around a trolley-tong loop for convenient shifting from furnaces to hammers. In one forging operation, an axle weighing 182 lb is completely formed in just two forging sequences.

One end of the square-section, rounded-corner billet, 1045 steel, is heated to 2225°-2250°F in a box type furnace and then is clocked in an 8000-lb steam hammer using a die in which the billet is put through rolling, breaking and blocking impressions in the first heat. After reheating in a second box type furnace, this same end is finish forged in a single-cavity die, shown in fig. 3, in a 10,000-lb steam hammer. Flash is trimmed immediately and the forging is restruck in the finish forging die to straighten it.

The second end of the billet is then heated in the first of the two box type furnaces and goes through the same cycle and dies as the first end to produce the finished forging. In this cycle, efforts are made to hold the axle to the specified length, but in some cases the forging has to be stretched subsequently to bring it within length limits. Such forgings, because of the multiple operations, are forged rather slowly but are completed at the rate of about 11 per hr.

Among the many forgings for which billets are heated in the new rotary hearth furnaces are numerous parts produced from stainless steel. One such, from type 316 stainless steel, shown being forged in fig. 4, is a valve component that weighs 11.8 lb when trimmed. Forging is done on a 4000-lb



FIG. 4—Type 316 stainless steel valve forgings weighing about 12 lb are produced in a 4000-lb steam hammer and a three impression die at the rate of about 40 an hr.

steam hammer using a die with rolling, edging and forging impressions, at the rate of about 40 an hr, including the trimming. Trimming is done hot in an adjacent press and is followed by final restrike in the forging impression. Rotary furnaces work better on stainless steel than box types because of relatively long soaking at moderate temperatures. Not until just before removal from the furnace do the billets attain the optimum forging temperature which, with 316 steel, is 2200°-2250°F.

Something of an innovation in drop forging, most of which is done on steam hammers in this plant, is the use of a Ceco steam operated ham-

FIG. 5—This two-pound shock absorber arm is forged from the bar in a 2500-lb Ceco steam-operated hammer at the rate of 225 an hr.



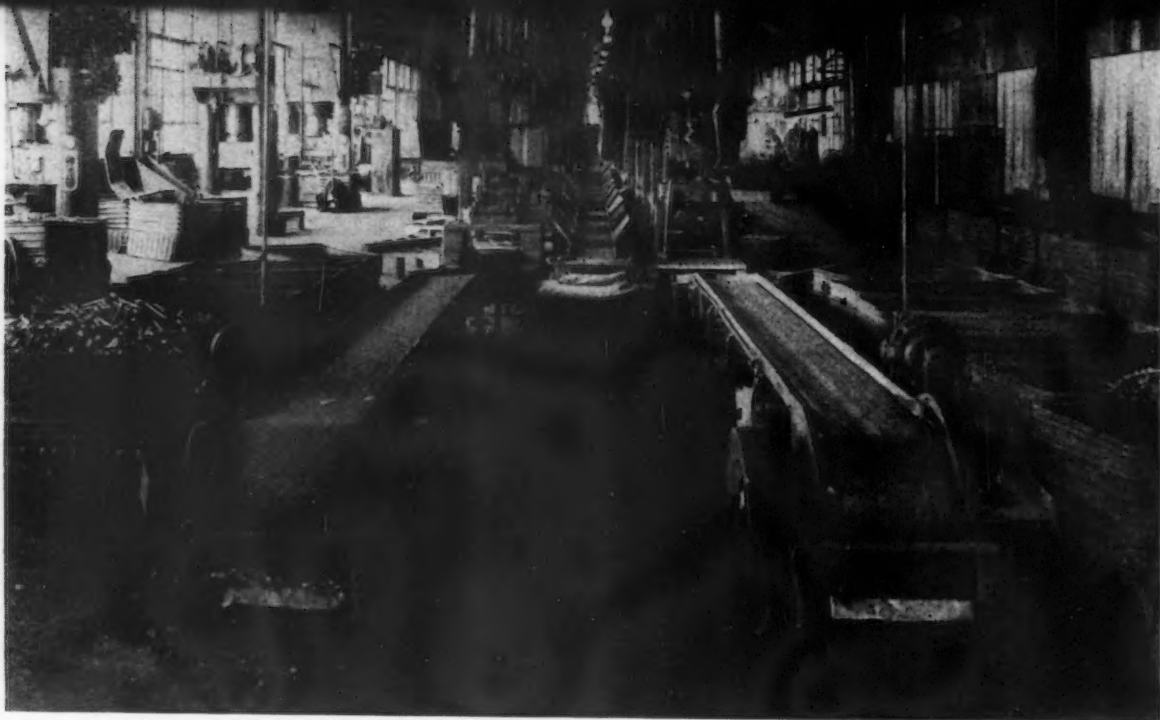


FIG. 6—Two rows of trimming presses are used to cold trim flash from small forgings that drop onto belts running below the presses. Belts deliver forgings to inspection stations in foreground, where sorting is also done.

mer of 2500-lb capacity for light work. This hammer forms 2.09 lb shock absorber arms from 1035 steel that is forged off the bar, as shown in fig. 5, at the rate of 225 an hr. Immediately after forming, this forging is hot trimmed and hot pressed on adjacent equipment.

Although many drop forgings are produced in single dies with two or more cavities, other forgings are brought to final size and shape in a separate finish-forging die in which the work may be struck only a single sizing blow. An objective in such cases is to keep the forging in the die a minimum length of time largely because the longer it remains the more heat is transferred to the die and the more rapidly does the impression deteriorate.

In the final forging cavity, whether in a block having multiple cavities or only one impression, the forging is sized. This impression must be precisely sized and is the most expensive of those used. In consequence, if its useful life can be extended, die upkeep costs are reduced. Hence, it is economical to minimize wear. This is of special importance on long run jobs because the effects of die wear determines how many sets of dies will be required.

On all large forgings and on many smaller ones, including nearly all in alloy steels, hot trimming of flash is most economical and is done immediately after forging. For many carbon steel forgings, however, especially small ones, flash can be trimmed cold at about double the rate of hot trimming. Most cold trimming is done on trimming presses arranged in two rows on elevated supports so that a belt conveyor can be made to pass under each press in the row. Lift trucks deliver to these presses tote boxes of forgings to be trimmed.

Trimming is done in dies and these are so

made that the forging is pushed through the die, as the flash is trimmed, and falls onto the belt. As shown in fig. 6, the belts that run below the two rows of trim presses are extended to run at bench height beside stations where inspection and sorting are done.

Each inspector removes those forgings that he must inspect and throws those that pass inspection into a tote box near his station but on the opposite side of the belt. The return side of the belts goes back just above floor level before returning again under the presses. Between the two rows of presses is a third belt conveyor onto which trim press operators push flash. This belt, at the far end of fig. 7, is elevated and drops the flash into a tote box for disposal.

Near the windows at left of fig. 6 are three hydraulic presses used to coin or straighten forgings that require such operations. Coining sizes forgings within closer limits than it is possible to hold consistently in hot forging alone. Some straightening of forgings is done also under a 1000-ton knuckle joint press.

Somewhat unusual in a forging plant of this size is the absence of heavy shears for cutting billets for forging from heavy bar stock. This is largely because it has been found more economical to heat heavy bars for shearing in their softened state than to do cold shearing in large shears.

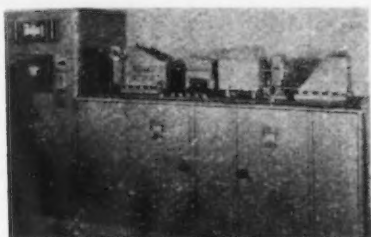
Heating is done in a box type furnace having a long inclined hearth set so that the loading slot faces the storage yard and can be fed from outside the building. Bars at red heat drop from the lower edge of this hearth onto a roller conveyor along which the bars are fed through an alligator shear where slugs are cut off.

New Production Ideas

A turbine blade fatigue tester, a carbide tool grinder, an all-purpose cutting machine, belt and disk sanders, a thickness detector, a ball-bearing grease tester, ac welders and a portable welding head, goggle valves, a valve refacer, portable tappers, drill and milling attachments and various other small tools and accessories are discussed this week.

Turbine Blade Tester

THE Sonntag SF-5 fatigue tester subjects turbine blades and materials to fatigue loads under conditions similar to those in high temperature service. This

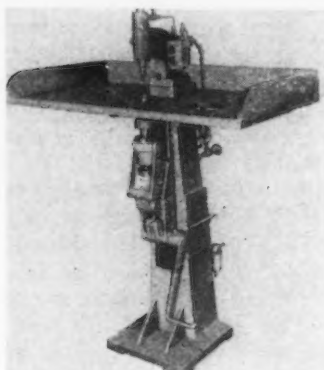


machine applies alternating flexure loads up to ± 1350 lb to a specimen at a frequency at 3600 cycles per min while it is held at temperatures up to 1800°F and is under tensile loads up to 8000 lb. Flexure loads are applied by the centrifugal force of a mass rotating at constant speed in an oscillating frame. This force is accurately controlled by varying the distance between the mass and its center of rotation. Inertia forces of this mass are compensated by springs and calibrating weights. Automatic controls maintain a constant tension of the specimen. Tensile loads, applied by a motor that drives the sprocket, are controlled by means of a sensitive relay and a switch in proving ring. The machine is mounted on a frame that floats on seismic springs. *Baldwin Locomotive Works. For more information, check No. 1 on the attached postcard.*

Pneumatic Riveter

INCORPORATING features not found on standard machines, a pneumatic riveter has been designed to produce consistently uniform work with high operator efficiency and minimum scrap. The air

motor which rotates the hammer piston has adjustable speed and the hammer rotates only when riveting to reduce air consumption. The motor may be removed and piston locked against rotation by keyed guide collar, for riveting rectangular lugs. Peins and anvils are quickly replaceable. Anvil elevating mechanism can be positioned to suit height of the work and fine adjustment is obtained with capstan type nuts. An automatic lubricator causes air going to piston to entrain a controllable amount of oil to

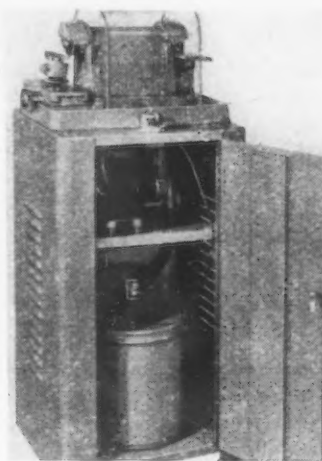


keep the piston properly lubricated at all times. An automatic timer unit for controlling length of hammering cycle is adjustable from 2 sec to 3 min. *Hill Machinery Co. For more information, check No. 2 on the attached postcard.*

Carbide Tool Grinder

SUITABLE for grinding clearance angles and chip breakers on single point tools and inserted blades for milling cutters, a carbide grinder which accommodates tools having up to 1 in. shanks, features small diameter wheels and is equipped for wet grinding. The spindle is engineered to run smoothly at 9000 rpm and is mounted in removable cartridge type ball bearing

unit. Spindle speed is said to permit high surface speed for small less expensive wheels for faster and more efficient performance. Diamond wheel has $\frac{3}{4}$ -in. wide grinding surface for off-hand grinding.



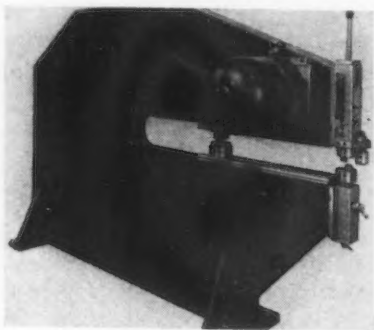
An all-angle vise gives quick set-ups for chip breaker grinding. Grinder is equipped with cabinet, 1/3-hp motor, coolant pump, wheel guards and 2 diamond wheels. The machine is obtainable in single and double end, or off-hand and chip breaker models. *U. S. Diamond Wheel Co. For more information, check No. 3 on the attached postcard.*

All-Purpose Shear

A NEW all-purpose, low-cost cutting machine for general shop use utilizes the principle of successive, fast shearing action that is claimed to produce a continuous cut with a finished and burr-free edge. The shear, known as the Truedge Shear, will cut any material such as brass, expanded metals, metal screen, and stainless steel. Material is not punched, but is sheared by a principle that eliminates resistance to feeding and turning. The lower

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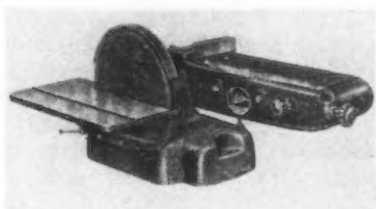
tool remains stationary while the upper tool which is spring loaded reciprocates vertically. Cutting speeds are rated at 10 to 40 fpm. Stainless steel up to 6 U.S. gage



and mild steel up to 5 gage can be cut. The shear is equipped with a $\frac{3}{4}$ hp motor and requires no extra equipment such as pilots, strippers, or templates. For cutting irregular shapes and small circles curved tools are used. The machine requires two adjustments: length of stroke and depth of penetration. *Elge Associates. For more information, check No. 4 on the attached postcard.*

Belt and Disk Sander

LONG, short and wide metal, wood and plastic stock can be handled on a belt and disk sander designed for sanding irregular shapes, edges, ends, curves, angles and double angles. The table may be used with disk or belt. The belt operates in horizontal and vertical positions and guards and stop are



removable for sanding curved pieces on either drum. Herringbone slots in the belt sander table top keep the underside of the belt smooth. Specifications: 10-in. diam. disk; 27 13/16 x 4-in. belt; 7 7/8 x 15-in. table; 4 1/4 x 11 7/8 in. belt support table; 3 1/4 in. diam rubber faced drums; belt speed 1150 fpm; spindle speed 1360 fpm; motor recommended, 1/4 or 1/3 hp, 1725 rpm. *Atlas Press Co. For more information, check No. 5 on the attached postcard.*

Stamping Trimmer

DEVELOPMENT of a new light-duty stamping trimmer for cutting up to 1/16-in. mild steel has been announced. This model, the 48-L, is an adaptation of the standard heavy-duty machine, and brings the benefits of machine trimming to the smaller shops and those handling small runs on a job-shop basis. Provision has been made for constant or variable-speed drive. The drive is through a differential type transmission that permits the use of rolls or cutters of different diameter without variation in peripheral speed. *Whiting Corp. For more information, check No. 6 on the attached postcard.*

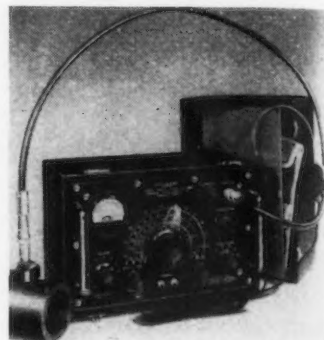
Goggle Valve

STAINLESS steel bellows is one of the design features of a new totally enclosed bellows type goggle valve now available. Goggle plate is solid, circular in shape, pivoted about an axle, and is entirely enclosed in the body of the valve. One valve seat is permanently fixed in position and the other is attached to a continuous stainless steel bellows which is moveable. When valve is open the goggle plate is housed in an enclosure below the valve seats and when closed, the plate is in the gas line between the fixed and movable seats. Pressure is applied to stainless bellows causing seats to contact the goggle plate. Enclosed construction is said to prevent cutting of plate and valve seats as pressure within the gas main and valve housing is equal. Misalignment of valve and main or distortion from parallel of valve seats is compensated by expansion joint action of bellows. Valve is offered in sizes from 24 to 144 in. *Edgar E. Brosius Co. For more information, check No. 7 on the attached postcard.*

Thickness Detector

FOR nondestructive thickness measurement from one side of materials including steel, copper, aluminum, glass and unfilled plastics, a new model of the Audigage thickness detector is recommended for applications including tanks, pipes, ship hulls, boilers, pressure vessels and sheet metal. New features include instrument indications for use in noisy locations; adjustable frequency modu-

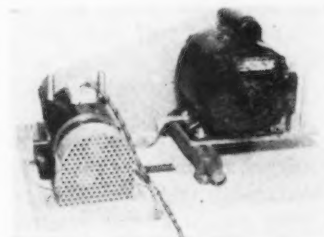
lation to facilitate measurement of seriously corroded equipment; special permeability tuning unit for increased sensitivity over the whole frequency range; increased fre-



quency range for measuring steel down to 1/16 in. Special ranges can be provided for thinner materials. The instrument is portable and battery operated for field use. *Branson Instruments, Inc. For more information, check No. 8 on the attached postcard.*

Ball-Bearing-Grease Tester

NEW equipment for testing ball bearing grease accelerates those conditions that contribute to the destruction of a grease, and enables motor users and grease manufacturers to compare the performance of one grease with another. The equipment consists of the ball bearing grease tester and a control box. The tester (illustrated) is a small motor-driven unit



with two bearings, one for testing and the other as a guide. A 500-w heater, located between the bearings, simulates the source and flow-paths of heat in an electric motor. The temperatures of the outer race of the bearings are measured by a pair of copper-copnic thermocouples. The control box consists of two thermostats and a panel on which are mounted a motor switch, a line switch, an actuation button, and a time meter. The time meter,

marked in tenths of hours, measures time on a cyclometer-type up to a period of one year. *General Electric Co. For more information, check No. 9 on the attached postcard.*

Ac Welders

NEW Sureweld ac welders for shop and industrial use are made in 12 models; seven for high-speed, heavy duty fabrication, and five for light production work. Advantages found in the models include a four-coil transformer with movable magnetic shunt that assures fine welding characteristics at every point within the output range. With correct ratio of open circuit to arc voltage, the Sureweld



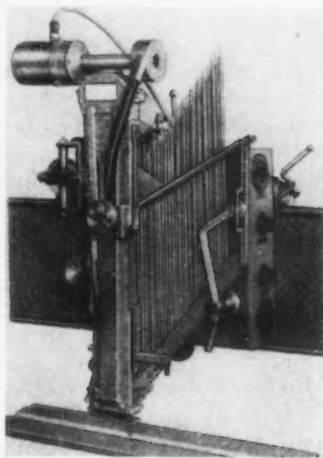
produces faster burn-off, proper penetration, and correct breakdown of usually hard-to-handle alloy rods. A stepless full range output control gives the precise welding heat needed. *National Cylinder Gas Co. For more information, check No. 10 on the attached postcard.*

Valve Refacer

THE new Thor 99 valve refacer is equipped with a double-grip collet and new speed chuck for fast, precision valve refacing at all standard angles. Sliding heads feature smooth-riding three-point suspension on hardened and ground slide rods. The collet is hardened, ground and internally lapped, gear driven by its own individual motor. A new speed chuck permits large butt-end valves to be admitted and released with only one turn of the 2½-in. hand wheel. *Independent Pneumatic Tool Co. For more information, check No. 11 on the attached postcard.*

Arc Welding Head

A NEW portable welding head for continuous arc welding with standard coated electrodes



produces faster and better welds than hand welding, it is reported, as the arc is not interrupted during automatic change of electrodes. It is recommended for most welds that have previously required hand arc welding and it is claimed one operator can tend two machines in production work. The first model will weld sheet and plate, join right angle or oblique sections, and longitudinal welds on curved surfaces such as pipes and tanks may be made. Electrode magazines designed to permit overhead welding and another model for butt welding pipe and tube will also be available. The welder is equipped with necessary controls and adjustments of welding current, regulation of arc length, as well as vertical and horizontal adjustments. Carriage speed adjustments between 1 and 40 ipm are made. Track of fabricated tubing is used to guide the carriage. *Elge Associates. For more information, check No. 12 on the attached postcard.*

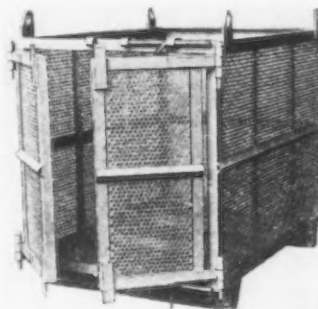
Furnace Atmosphere Indicator

THE relative oxidizing or reducing conditions of the atmosphere within a furnace, or metal heat treating oven can be indicated with a new instrument that analyzes the gases continuously in such a way that a complete record of the furnace conditions during an entire run is furnished automatically on an electrical indicator. The instrument utilizes the combined

physical properties of the mixed gases occurring in the combustion of fuel in such a manner that an empirical indication is obtained free from ambiguous indications. Each gaseous component of combustion contributes to the final reading approximately proportionate to its relative oxidizing or reducing effect. The instrument does not require any adjustments once put into use and the normal furnace controls are operated in the usual manner. The indicator shows the direction of the atmospheric change within a furnace in a positive manner. It is graduated from 0 to 25 and operates from 115 v, 60 cycle power source. *Charles Engelhard, Inc. For more information, check No. 13 on the attached postcard.*

Immersing Basket

FABRICATED of high-tensile, corrosion resisting steel, for positive resistance to acid pickling solutions, an immersing basket has



been designed for transportation by crane or fork lift truck. It features heavy-duty construction and is supplied in any size to meet varying specifications. *Phillips Mine & Mill Supply Co. For more information, check No. 14 on the attached postcard.*

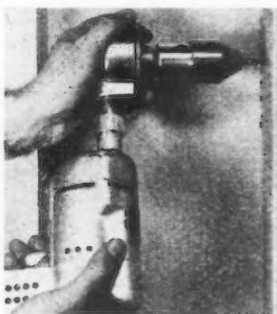
Portable Tappers

AUTOMATICALLY reversible push-pull tappers are pushed by the operator for forward rotation and pulled for reverse. The tools are suitable for all tapping operations up to ¼ in. capacity in ¼-in. sheet steel and cleaning up to ¾-in. tapped holes, and are offered in 12 models with a speed range including 450, 750, 1100, and 2500 rpm. Features include high torque; variable speeds; pistol grip, button and lever control; simplified tap changing and adjusting; and trouble-free reversing mechanism.

Standard equipment includes a 10-5/16 in. Jacobs tapping chuck with wrenches, speed regulator and 1/4-in. hose. *Aro Equipment Corp.* For more information, check No. 15 on the attached postcard.

Drill Attachment

WITH an angle-head attachment, right angle drilling is possible with an electric drill. A specially designed 1/2-in. Jacobs chuck fits the bull buffer, which in turn fits the chuck of any electric drill. The bull buffer's gear reduc-



tion adds power to the drill, reduces its speed so that drilling can be accomplished without injury to the drill. *E. K. Bertram Engineering Co.* For more information, check No. 16 on the attached postcard.

Collet Chuck

DESIGNED to speed production drilling and tapping operations, a mechanical linkage adapts the Goodwin quick-acting collet chuck to any standard drill press in approximately 15 min with the use of two bolts. Linkage connects the drill quill to chuck collar so that chuck is automatically closed and locked as tool approaches workpiece. Return of the drill press handle releases the workpiece and the chuck can be fitted with a spring ejector to facilitate rapid removal. *Goodwin Mfg. Co.* For more information, check No. 17 on the attached postcard.

Portable Tools

A NEW line of 360 cycle portable abrasive tools includes small wheel grinders, cone sanders, 4, 6, and 8-in. straight grinders, 6-in. cup grinders, 7 and 9-in. sanders, and 9-in. polishers. The tools are claimed to provide more power per unit of weight than corresponding

air, 180 cycle or universal tools. The motor is a squirrel cage induction type in which the speed is governed by the frequency of the power supply which is 360 cycle current supplied by an inductor frequency converter or motor generator. Motor spindle speed is 21,600 rpm. For heavy operations the motor speed is geared down to the correct spindle speed. Cooling is provided by a solid web fan which draws air from the rear through 12 cooling channels and expels heated air to the front end of the tool. *Rotor Tool Co.* For more information, check No. 18 on the attached postcard.

Weld Bosses

WELD bosses, in a variety of shapes and dimensions, have been made for projection welding to sheet metal and to thin metal plates. Thicknesses range from 1/16 to 3/4 in. and the shapes are round, square, and flanged. The round and the flanged bosses are available in low carbon steel, brass or 18-8 stainless steel. The square bosses are of low carbon steel or brass. Production sizes are standardized in thickness, outside dimensions, and hole diameters. *Ohio Nut & Bolt Co.* For more information, check No. 19 on the attached postcard.

Pusher Attachment for Trucks

TO simplify the handling of metal drums, a twin pusher attachment has been designed for

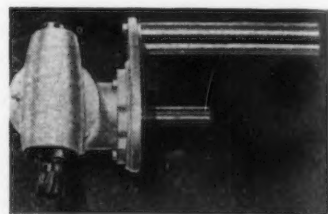


use on standard Skylight electric fork trucks of all capacities. With high pressure hydraulic operation

and individual push button controls, the rams can be used independently or simultaneously. The unit includes its own motors and pumps. It can be detached quickly and be replaced by standard forks. An overhead guard protects the operator. *Automatic Transportation Co.* For more information, check No. 20 on the attached postcard.

Universal Milling Attachment

RUGGED construction, simple design, versatility and ease of installation on any small milling machine feature a new universal milling attachment. It is equipped with two heavy duty steel driving



gears and a large idler gear to take the heaviest cuts within the capacity of the milling machine. The attachment is furnished with an arbor of the taper required for the milling machine with which it is used, and is driven by the milling machine spindle at the spindle speed. Equipped with a No. 7 B&S taper spindle, this attachment can be used for milling, drilling, or boring on any angle or at any plane. *U. S. Machine Tool Co.* For more information, check No. 21 on the attached postcard.

Boring Tool

E-Z SET boring tools are now available with improvements designed to increase tool efficiency and service life. Improvements include elimination of the gib in locking the tool block dove-tail to assure faster action, more positive locking of tool block, permitting wear adjustment; hard chroming of all wear surfaces; and flash chroming of all other tool parts to provide corrosion protection. Increased capacity has been provided by three-position feature for boring bar in tool head. These tools are available in models No. 30, 31 and 32, with maximum boring bar capacities of 1/2, 1 and 1 1/2 in. respectively. They cover a boring



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N-A-X HIGH-TENSILE STEEL

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Because of its inherent high strength and toughness, up to 33% more units per ton can be produced than with ordinary carbon sheet steel.

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Assembly Line . . .

WALTER G. PATTON

• General Motors impartial umpires are expendable . . . Alexander is sixth since 1940 . . . Briggs shops around for Pittsburgh plant . . . Most auto operations to remain in Detroit.



DETROIT — If you have personal ambitions to become an umpire, you had better choose baseball rather than industry. Particularly in the automobile industry, umpires are expendable.

This fact was re-emphasized recently when Gabriel N. Alexander of Detroit was selected as Impartial Umpire under the agreement between General Motors and the United Auto Workers' Union (CIO), succeeding Mr. Saul Wallen of Boston. Mr. Wallen has served less than a year. He is the sixth umpire since 1940. About half of the GM umpires have retired voluntarily; the others have been asked to step down from their \$20,000 a year job for a variety of reasons.

Sources close to the Detroit labor picture agree that union politics has sometimes been a factor in making an umpire change. Alleged fraternization may be another cause. In any case, a labor umpire is usually as lonely a figure as the "man in blue" who makes the decisions on the baseball field.

It is to the credit of both GM

and UAW-CIO that neither party has thus far permitted the umpire system to deteriorate to a point where a single unfavorable decision or a prospective unfavorable decision has resulted in a change of umpires. Vigorous attacks are sometimes made on the umpire in union publications. Once a case has been submitted to the umpire, it cannot be withdrawn by either party except by mutual consent. This has probably helped to keep down the umpire turnover figure.

General Motors and UAW-CIO pioneered the umpire system in settling labor disputes back in 1940. Every decision of the umpire since that time has been accepted and carried out by both parties.

It should be emphasized that the umpire for GM operates somewhat differently than the Ford or Chrysler umpires. The umpire for both Ford and Chrysler functions, broadly speaking, as a mediator and an arbitrator. In the case of GM, the umpire often takes direct testimony to determine the facts. After the facts are determined he calls the company or the union "safe or out" under the contract. His powers are precisely limited but in those fields in which he functions, the GM umpire makes extremely important decisions. These decisions are gradually building up to the equivalent of a code of labor law for both parties.

Under the GM setup the umpire hears cases involving discrimination for union activity; recognition; representation; grievance procedure; seniority; disciplinary layoffs and discharges; call-in-pay; working hours; leaves of absence; strikes and stoppages; vacation pay and vacation pay allowances. While the umpire has full discretion in cases of violations of shop rules, strikes and stoppages, he cannot order back pay.

UNDER the GM system, a systematic effort is made to wash out grievances at the start. This is often accomplished between the worker and his supervisor. Where this step fails, the grievance is put in writing and submitted to the Shop Committee. If the grievance

is still unadjusted, the case goes next to the Appeal Committee, consisting of top union and top plant management officials.

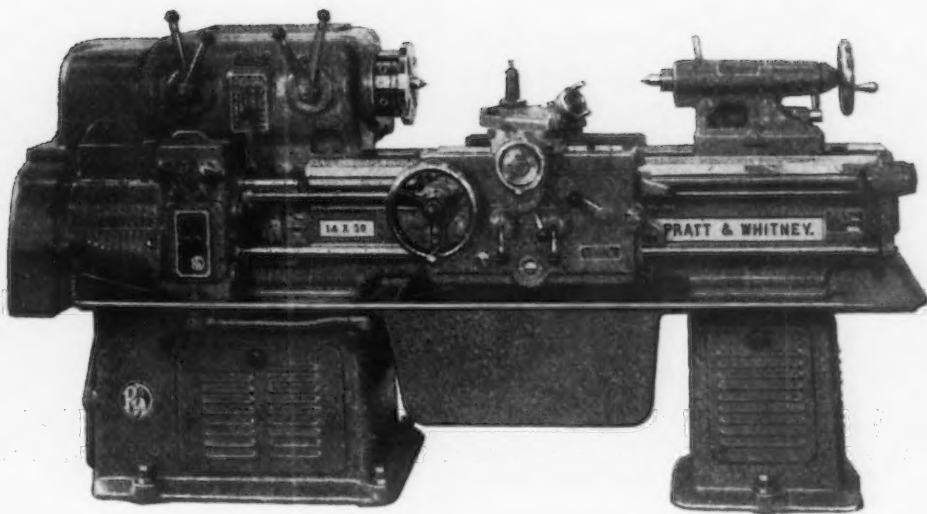
Failure to settle the grievance at any of these levels qualifies the dispute for submission in writing to the umpire, assuming the question falls within his delegated powers.

During the year 1947, in addition to thousands of cases settled by the worker and his supervisor, 12,697 grievances in all of GM's plants were carried through the first step of the grievance procedure. Approximately 11,822 were taken through the second step. Approximately 3600 reached the Appeal Committee and the umpire ruled on only 209 cases. The number of cases heard by the GM umpire is substantially less than the number of cases taken to the umpire by other automotive companies and their unions.

About 45 pct of the GM cases involved wages, seniority or working conditions. It should be emphasized that under the GM system, the umpire functions mostly in the area of disputes involving working standards and wage classifications, particularly wage disputes arising from attempts to classify new jobs.

Mr. Alexander started his 1-year service Nov. 15. His salary and expenses are shared jointly by the company and the union. Previously, he has acted as arbitrator for the United Automotive Workers, United Rubber Workers, United Furniture Workers, United Dairy Workers and the United Electrical Workers. He has also served the Teamsters of the AFL and the International Assn. of Machinists. He is an alumnus of Wayne and Harvard Universities. Alexander graduated from the University of Michigan Law School in 1933.

CONFIRMATION of the report that Briggs Mfg. Co. is shopping around for a plant brings to three the number of auto concerns who have officially announced their intention of locating in the Pittsburgh area. While no commitments have been made, the fact that Fisher Body and Kelsey-Hayes



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Wheel have made similar moves would indicate that Briggs has serious intentions. Current reports indicate that Timken-Detroit Axle and other concerns may be contemplating a similar move.

It is reported that the plant under consideration would employ about 1200 workers. Briggs is now operating eight Detroit plants. An additional plant is located at Evansville, Ind.

While the company obtains a substantial amount of its steel in the Pittsburgh area as reported—from Jones & Laughlin, Wheeling and Weirton — other steel sources, including conversion sources, are relied upon to meet its growing steel requirements. In addition to Plymouth and Packard bodies, Briggs makes a large number of stampings for DeSoto, Dodge and Chrysler. Recently the company started producing Willys station wagon bodies and other vehicle stampings. A large plumbingware division is also operating in Detroit.

Most Detroit steel men agree that while the f.o.b. steel distribution system is a factor in the present industrial movement, the controlling consideration is rising freight rates. This leads many of the crystal ball gazers here to the conclusion that in addition to moving part of the auto industry from

Detroit to Pittsburgh, the railroads may some day learn they have played a prominent part in bringing greater steel production to Detroit.

The new McLouth electric steel plant, these sources say, is only the beginning. Consumer interest in such a move is indicated by the fact that more than half of the financing of the new McLouth mill has been furnished, it is reported, by prospective steel consumers.

Several conditions in the Pittsburgh market have proved to be obstacles to movements out of Detroit, it is said. Some auto parts—frames are an example — would seem to have a more logical place in Detroit at the present time. Also, the housing situation in Pittsburgh is not encouraging and some Detroit executives are none too confident about the Pittsburgh labor market.

In the case of the new Fisher Body plant, the logic of the Pittsburgh move is easily demonstrated. Considerable savings in freight charges will be realized on movements of both steel and scrap. In addition, finished stampings can be distributed from Pittsburgh to the eastern seaboard, Atlanta and Cleveland from a more central point. However, in the case of Briggs supplying to Chrysler, all of the production is in the Detroit

area. Up to the present time, Chrysler has not utilized the knock-down assembly technique adopted by General Motors and Ford.

THE present picture may be reduced to the simple fact that any Detroit producer who is not assured of an adequate steel supply before moving to Pittsburgh is, as one source commented "putting its head in a bear trap." Assured of adequate steel supply, the housing labor problems will still require considerable study before a decision is reached, this source added.

Meanwhile, there are many Detroiters who argue strongly that steel can be made just as economically in Detroit as it can be produced in Pittsburgh or Chicago. They point to the success of the Great Lakes operation to prove the point. These sources contend that if electric melting is used, the Detroit power situation is much more favorable than it would be in many other cities. Edison officials here have assured the company's customers that, barring unforeseen difficulties, no electricity famine is foreseen here this winter. Within a year or two, the Edison facilities should be a good jump ahead of customer demand, it is promised.

These sources also argue that if the auto industry leaves Detroit, only limited segments will go in the early stages. Most auto operations, it is contended, will logically remain here. As one observer expressed it, "It looks like Detroit is going to trade some automotive capacity for some steel capacity. Even if this area suffers a net loss by the movement, the loss will not be great. And it is bound to be much less than a lot of people are predicting nowadays."

* * *

LAST week General Motors Truck & Coach Div. started delivery of 900 coaches for the City of New York and 100 for the City of Chicago. The new coaches are 51-passenger capacity for New York and 55-passenger for Chicago. These are the largest single deck motor coaches ever built for city transportation, it is reported.

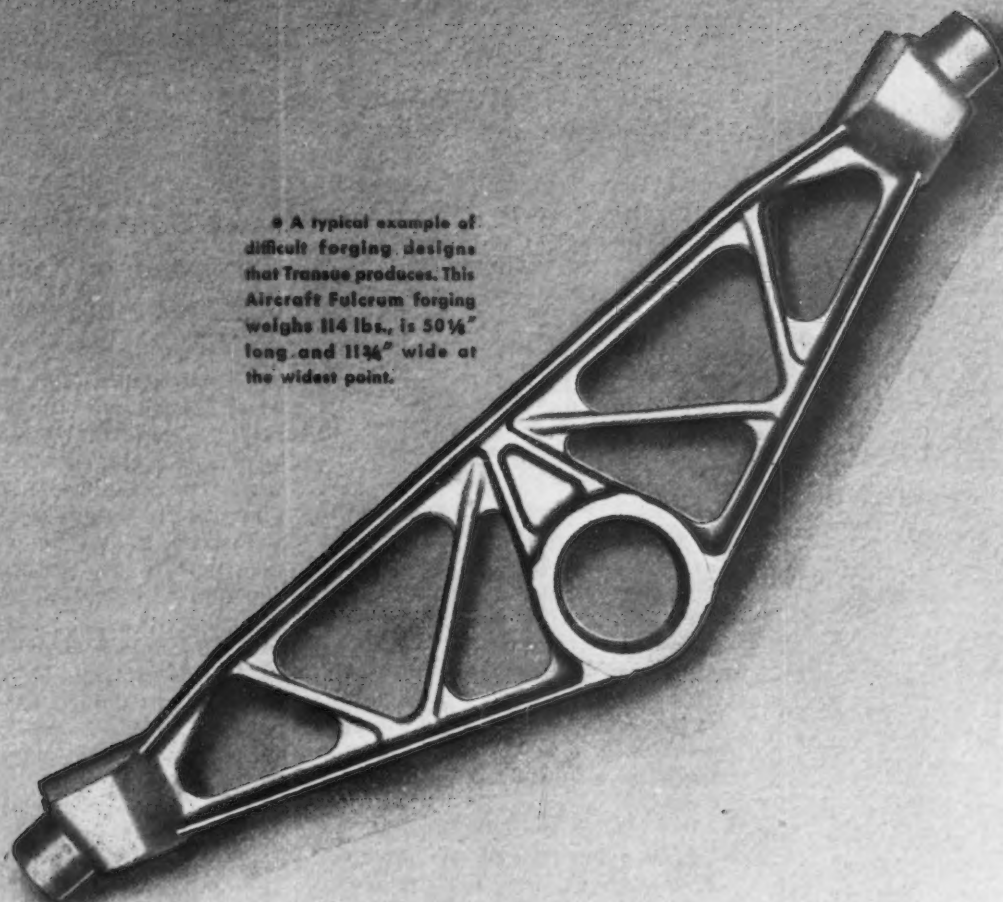
Representatives of the daily papers, radio and trade press were present last week when Col. Sidney H. Bingham, Commissioner, Board of Transportation for New York City, took delivery of the first new GMC coach.



M. B. BROOKS, assistant car foreman of the Detroit, Toledo & Ironton, R. R., is shown blocking a load to the nailable steel floor of a gondola. More than 600 cars are now equipped with this unique construction which consists of 8 in. channel laid crosswise in the car. Soft nails driven into grooves are deformed by the bending action of the channel flanges. The floors are made of Great Lakes' high tensile NAX steel.

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OVER 50 YEARS OF FORGING PRODUCTION EXPERIENCE

• Industry balks at releasing distribution data . . . New trade agreements coming . . . Skilled DP's available.



WASHINGTON—A look at another kettle of trouble that has been brewing for steel producers for some weeks now reveals that Senator Martin, R., Pa., is having trouble in extracting statistics on steel shipments from the major producers.

Two months ago, Senator Martin's steel subcommittee of the Senate Small Business Committee asked the nation's principal steel producers to tell his subcommittee in detail where they sold their steel in 1940 and in 1947 (THE IRON AGE, Sept. 16, p. 123). Senator Martin said that a pretest by subcommittee investigators at offices of the U. S. Steel Corp. and Bethlehem Steel Corp. disclosed that the information he sought was available.

Senator Martin had at first planned to ask his distribution questions—contained in a bulky, four-part questionnaire—of 20 principal producers. He finally cut the list down to 15 companies—U. S. Steel, Bethlehem, Republic, Jones & Laughlin, Youngstown, National, Inland, Armco, Colorado Fuel & Iron, Pittsburgh, Granite

City, Sharon, Wheeling, Follansbee, and Alan Wood. He asked for replies in 30 days.

But the replies didn't come back to Senator Martin and, if the larger producers have their way, they won't be coming back. The producers are afraid—and with good cause—that the information (a) may leak to competitors, despite assurances that it will be held in confidence (b) that all or part of it may be used by certain members of Congress or by the Administration for political purposes.

Some of the producers have made a counterproposal to Senator Martin. Instead of your committee doing this work, they propose, let a firm of certified public accountants do the job. And, furthermore, let the figures show only totals of shipments, rather than give product-by-product and customer-by-customer breakdowns, they ask. Mr. Martin is now mulling over these offers.

THE reluctance of the producing companies to turn over their records to Mr. Martin's subcommittee is understandable. In the past, other data submitted in confidence to congressional committees or to agencies or departments in the executive branch of the Federal Government has unaccountably "leaked" despite assurances of privacy.

Then, too, with the strong possibility of Senate Small Business Committee leadership passing from the hands of Senator Wherry, R., Neb., to Senator Murray, D., Mont., there is ample reason to suspect that anything the industry may say in the Martin questionnaire will be used against it. For example, Senator Murray long has advocated that the Federal Government build and operate new steel capacity if the industry is unwilling to expand in accordance with his personal views.

Steel was in the Washington spotlight during most of 1948 and it looks as though it will be in the spotlight even more in 1949. Both the White House and the Congress

will be on the lookout for handy scapegoats for shortages and high prices.

More Nations Due to Be Included in Reciprocal Trade Agreement Pacts

Washington

• • • Spadework for adding another 11 nations to the 23 now taking part in the reciprocal trade agreements program is well under way. The actual horse trading will take place in Geneva next April.

Nations which have asked to take part in the program worked out at Geneva in 1947 are Sweden, Denmark, Finland, Italy, Greece, Peru, Dominican Republic, El Salvador, Nicaragua, Uruguay, and Haiti. Individually, imports from these nations are small but as a whole the volume is currently about \$120 million monthly.

Three basic steps have been taken by the United States in preparation for the April trade conference. The State Dept. issued formal notice in September of its intention to engage in negotiations with these 11 nations; immediately following the election, the White House submitted to the Tariff Commission a list of items for which it was suggested that import duties might be modified in exchange for concessions to us. The Commission has set Dec. 7 as the date on which it will begin hearings on this list.

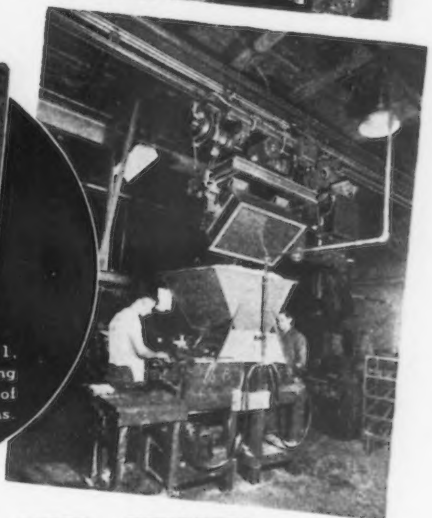
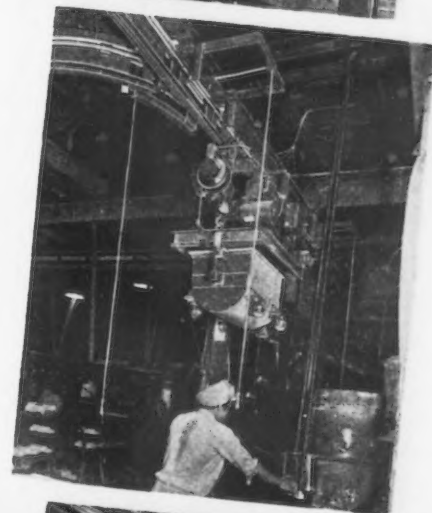
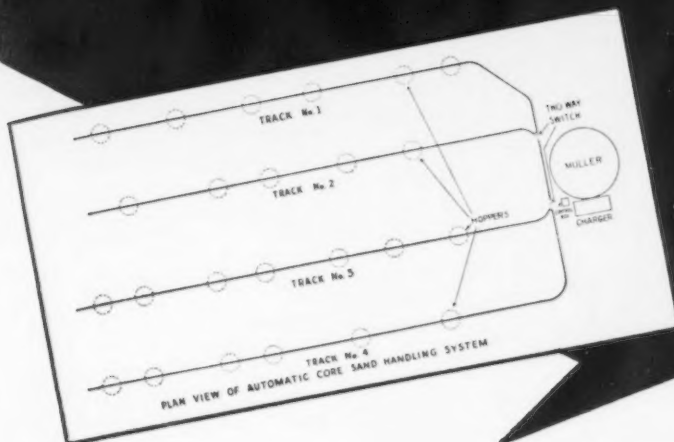
About 200 tariff classifications are affected by the White House list, about a dozen of which relate to major basic steel items, and these are concerned mostly with one nation—Sweden. However, several hundred items concern products fabricated wholly or in part from steel.

Included in the list of Swedish imports on which it is suggested the duty be modified are ingots, blooms, slabs, sheets, plates, wire rods and bars, wire as such, various forgings and castings, and tubes.

Included in the fabricated goods are dozens of hardware items in-

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This compact system requires only two men to keep 24 core benches supplied with fresh core sand. Charger receives sand from underground conveyor. Sand is loaded and automatically dispatched and dumped to any one of 24 stations, on four tracks, by push button control. Track switches are manually operated. Each track can be increased to 16 stations or 64 in all. This is another of the hundreds of American MonoRail installations that have cut handling costs. Let an American MonoRail engineer show you how it can be done in your business.



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THE IRON AGE, November 18, 1948—129

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cluding cutlery, hand tools such as pliers, files, scythes, planes, chisels, etc. Also on the negotiating list are a number of machinery items such as candy making, paper making and food grinding or cutting equipment.

In order to save time for both industry and government, it has been arranged that those who wish to appear for or against tariff changes need do so only once. Information, confidential or otherwise, submitted to the Tariff Commission will automatically be made available to the State Dept. Committee for Reciprocity Information—eliminating necessity for a second appearance.

American Industry May Utilize Crafts of DP's

Washington

• • • American industry might do well to check into the availability of skilled displaced persons now eligible for entry into the United States. Several shiploads of DP's have already reached this country under the provisions of the law enacted by the 80th Congress.

Available data indicate that

there are large numbers of DP's skilled in the metal trades. Included in this category are electroplaters, foundrymen, forgers, heat treaters, machine operators, machinists, metalsmiths, millwrights, welders and tool makers.

An indication of what might be done comes from the mining industry. This industry has been given assurances by the Displaced Persons Act Commission that the bringing in of miners will be recognized under the regulations now in preparation. It is not yet clear as to the number of miners that may be brought in, but the Commission has stated that it will be necessary for anyone employing them to provide transportation from the U. S. port of debarkation to the mining communities.

Mining companies needing men are advised to communicate with the Displaced Persons Act Commission, Department of State, Washington 25, D. C., stating the number of men they can put to work and furnish with living quarters.

The same advice is applicable to anyone in industry who feels that he might be able to find skilled workers among the ranks of the displaced persons.

70,000 Tons of Lead Sought for Stockpile

Washington

• • • Buying of 70,000 tons of lead for the national stockpile (less tonnages already contracted for during fourth quarter 1948) for delivery before next June 30 can be better accomplished through individual deals with producers than by attempting a voluntary allocation program.

This is the majority opinion resulting from a second meeting of primary producers and importers with Commerce Dept., Munitions Board, and other government officials last week.

Industry representatives have pledged full cooperation with the Federal Bureau of Supply in seeing that the above tonnage is obtained for the stockpile. Similar action has already been taken by the copper and zinc industry.

In addition to representatives of the Economic Cooperation Administration, National Security Resources Board, Treasury Dept. and Bureau of Mines attending the meeting were the following representatives of industry:

R. E. Dwyer of Anaconda Copper Mining Co.; Ray M. Evans, National Lead Co.; E. N. Hickman, American Metal Co. Ltd.; Simon D. Strauss, American Smelting & Refining Co.; Felix Wormser, St. Joseph Lead Co.; Neil R. Taylor, S. S. Smelting, Refining & Mining Co.; Martin Wehncke, Brandeis, Goldschmidt & Co.; Frank Carberry, Metal Traders, Inc.; S. Ullman, Philipp Bros. Inc.; and Henry B. Van Sinderen, of C. Tennant Sons & Co.

Wire-Making Machines To Become Standby Capacity

Washington

• • • Some 400 wire-making machines, reclaimed from the War Assets Administration under the JANMAT program, have been stored by the Army in Signal Corps depots.

They are largely comprised of stranding and twinning machines, representing roughly nearly four times as many such machines as existed prior to the outbreak of war in 1941. However, the number in storage accounts for no more than 40 pct of the total in use at wartime peak.

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BY J. R. WILLIAMS



Thousands of 'em!

Thousands of Precisionaire standard semi-finished gaging plugs are carried in stock for quick delivery.

Shipments made within one week from receipt of complete information—24 to 48 hours in emergencies.

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• High quality Eagle Mountain ore begins to flow to Kaiser furnace at Fontana . . . Immediately saves 35¢ a ton on freight alone . . . Cost of coking coal still high.



LOS ANGELES—Bald Eagle Mountain about 200 miles due east of here in Riverside County is doomed to get balder from now on as Kaiser Co. Inc. continues to blow off its top at the rate of 20,000 tons per blast to bring out the rich deposits of iron ore for its blast furnace at Fontana.

Last week mining operations began in earnest with the first train load of approximately 1600 long tons, 53 pct iron content ore leaving the mine on the recently completed, 52 mile long railroad, to Ferrum on the Salton Sea where it was picked up by the Southern Pacific and carried on to Fontana, approximately 162 miles from the mine.

This Eagle Mountain ore body has long been in litigation and only early this year Kaiser Co. secured a clear title to the mineral rights on the 2700 acres by payment of \$1,132,811 to Edward T. Foley, Pasadena capitalist and Harlan J. Bradt, mining engineer who at one time controlled all mineral rights on the property. Mr. Bradt had originally acquired from the Southern Pacific Land Co. in 1940 a contract to lease and purchase the Iron Chief mine (as it is sometimes called) for \$1,500,-

000. Kaiser interests had purchased the property itself from the Southern Pacific for approximately \$1 million. Including the cost of the railroad, improvements and mining equipment it is estimated that this ore deposit has cost the Kaiser Co. approximately \$6 million.

Richness of the ore and abundance of reserve on this property have only partially been approved. According to Kenneth Powell, superintendent of raw materials for Kaiser Co. Inc., there are approximately 26 million tons of high grade ore already proved in two separate deposits and an estimated 40 million tons of good quality ore still unproved. The division of mines of the State of California reports that there are about 43 million long tons of ore containing 30 pct or more of iron estimated to be present in the Eagle Mountain area. This report further states that 28 million tons contain more than 30 pct of iron in sample bodies and can be "said to be measurable ore; the rest amounting to 15 million tons is inferred or in bodies of various sizes and degrees of acceptability."

Assuming that there are approximately 60 million tons of recoverable and useful ore in the mine, the cost per ton in the ground therefore would be about 10¢.

Iron content is high throughout this deposit and sulfur content is at a reasonably low figure which will make it necessary to sinter only about 35 pct of the material, whereas the ore formerly obtained from the Vulcan mine near Kelso, Calif. had a higher sulphur content and was in large measure a fine material which made it necessary to sinter approximately 50 pct. Eagle Mountain ore is both hematite and magnetite and is classed as a coarse, hard ore.

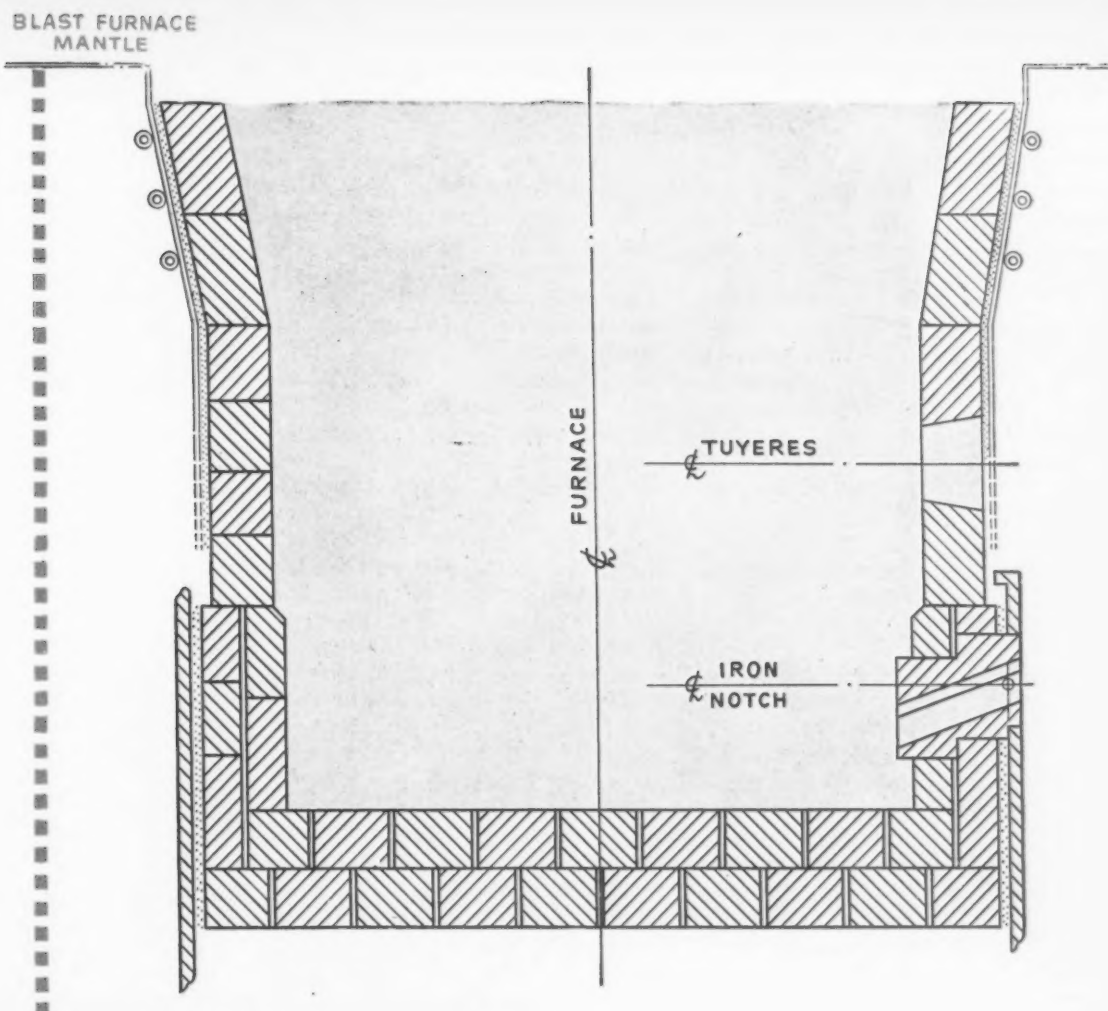
TEST runs made on Eagle Mountain ore in the middle of last year resulted in very optimistic reports from the blast fur-

nace at Fontana. During that 17-day test run the burden in the furnace consisted of 78.4 pct of Eagle Mountain ore and with coke consumption of 1451 lb per ton of iron average daily production of iron was 1233 net tons in a furnace which has a rated capacity of 1200 net tons per day. The ore used during that test ran 53.91 pct Fe and .293 pct sulfur. Some of the ore in the test run was sintered.

Kaiser officials have estimated that the Eagle Mountain deposit should last for approximately 40 years at the present rate of consumption, although there are some who believe there is a sufficient amount of ore present in the deposit which, with beneficiation would carry operations through an additional 30 years. These figures of course are predicated on the operation of only one blast furnace, and on completion of the second 1200 ton stack which was recently announced, these figures would have to be cut in half.

Vulcan mine which formerly supplied the requirements of the Fontana blast furnace, has been inoperative since last year and the furnace has been fed from a Vulcan stock pile and from iron ore purchased from Utah. It is now planned that approximately 30,000 tons of ore will be taken from the Vulcan stockpile, the same amount purchased from the Utah mine and about the same drawn from the new Eagle operation. At capacity, Eagle Mountain mine will produce approximately 3500 tons per day, but this figure will probably not be reached for the next 4 or 5 months. Daily requirements at the blast furnace are now approximately 2200 tons of ore and about 840 tons of coke.

Operators of the Fontana blast furnace are proud of this low ratio of 1400 lb of coke per ton of iron which they have been able to maintain for sometime. Incidentally, the blast furnace which was shut down on July 25 was put back into operation Oct. 1 and is now reported as producing iron at rated capacity and its operators are confident that



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production will soon be increased to more than 1300 tons of iron per day.

While Kaiser officials are reluctant to state just what the delivered cost of the Eagle Mountain ore at the Fontana blast furnace will be, they do state they are confident they will have the lowest delivered cost of iron ore of any plant in the country. Mr. Powell went so far as to say that in his estimation the delivered cost will be "something less than half that of Lake Superior ores delivered at Lower Lake ports." There will be an immediate saving of 35¢ per gross ton in freight alone as against present hauling costs from the Vulcan mine. (THE IRON AGE, Sept. 16, 1948, p. 108).

WITH the relatively low percentage of over-burden to contend with, open pit or strip mining operations can be handled economically following dislodgement and breakage of the ore by blasting. Diesel powered shovels of 5 ton capacity, load the ore into dump trucks which transport it to crushers and screens from which the ore is automatically loaded into a stockpile. Ore is loaded into rail cars from a pit in the bottom of the stockpile at the rate of approximately 1200 tons per hour by means of a conveyer belt. Normally approximately 60-ton capacity cars are loaded at the rate of one every 5 min. A stockpile of approximately 44,000 tons will be main-

tained at the loading site.

With the opening of this new mine and the recent announcement to the effect that Kaiser Co. intends to construct a new blast furnace there has been some conjecture as to the possibility of locating this new stack at, or near, Eagle Mountain. While such a project in the middle of a barren desert would present several problems in logistics, Mr. Kaiser has never been noted for allowing apparent obstacles to prevent his carrying out a development which may ultimately prove extremely efficient. As the operation now stands the ore cars return from the trip to Fontana as empties and might well carry coke or even coal to a furnace located near the mine.

There is no doubt that use of Eagle Mountain ore will considerably reduce iron cost at the Fontana furnace materially, but the company still must pay a high price for its coking coal which comes from Utah at a rail cost alone of \$5.09 per ton. While the company has not released its actual cost figures on the coal at its Utah source, it is believed to be in the neighborhood of \$4.00 per ton which would make the cost well over \$9.00 at the furnace. However, even with the lower quality and higher cost of Vulcan ore Kaiser officials contended that their costs for producing iron were well in line with the national average and \$17.00 per ton was frequently quoted as being the actual figure.

California Ore Reserves About 122 Million Tons

San Francisco

• • • More than 100 iron deposits are located in 31 of California's 58 counties according to Bulletin 129, "Iron Resources of California" which was prepared under the direction of Olaf P. Jenkins, chief of the California Division of Mines and just recently released.

According to this comprehensive report the future production of iron from California sources will come from 13 principal localities described in the survey. Reserves of commercial ore in California were estimated at approximately 122,658,000 long tons and exceed the estimates of reserves of any of the other 11 western states, comprising about 30 pct of the reserves of that area and 2½ pct of the national total.

Among other data is included a thorough analysis of the recently opened Eagle Mountain mine owned and operated by Kaiser Co. Inc., which among other data includes the following as applicable to the iron ore reserves of the east end of the Eagle Mountain district: 2.2 million long tons of 30 pct or less Fe ore; 2.7 million long tons of 30 to 40 pct Fe; 10.2 million long tons of 40 to 50 pct Fe; and 15.1 million long tons over 60 pct Fe. The total reserve for this area is reported as 43 million long tons.



EAGLE MOUNTAIN FEEDS ITS BROOD: Trucks roll down serpentine paths carrying iron ore to be crushed and belt-conveyed to the stockpile, left center. The ore train on the siding awaits loading for shipment to the Kaiser plant at Fontana. Operational buildings and miners' model community are clustered in the background.

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M. A. KING, engineering vice-president, Jeannette Div., Elliott Co.

PERSONALS

o o o

• **William J. McGraw**, manager of electric tool sales in the New York territory, has been appointed manager of the Cleveland branch of Independent Pneumatic Tool Co., Aurora, Ill. **E. B. Rosell**, electric tool service engineer in the Chicago branch territory, succeeds Mr. McGraw as manager in the New York territory.

• **George C. McClure** has been named executive vice-president in charge of operations, Hercules Steel Products Corp., Galion, Ohio. **Fred Biszantz** has been appointed vice-president and advisory engineer in charge of research and development and **Alfred Dangler, Jr.** vice-president in charge of operations at Star Mfg. Co., St. Louis.

• **R. R. Griner** has been appointed western sales agent for the Electric Furnace Co., Salem, Ohio. Mr. Griner, who until recently has been the furnace engineer for Wright Aeronautical Corp., Paterson, N. J., was formerly an erection and service engineer with the Electric Furnace Co.

• **Carroll Edgar** has been made representative in the Seattle area for Kennametal, Inc., Latrobe, Pa. **William L. Chambers**, Kennametal application engineer, has been transferred from the Midwestern District to the Pittsburgh District office. **John D. Cook** has been appointed application engineer in the Midwestern district, working out of the Chicago office of the company.

• **Orville F. Figley** has been appointed manager of the Chicago district of U. S. Steel Supply Co., Chicago. **Frederick L. Bruckner** and **Arthur W. Johnson** have been appointed assistant district manager and **Howard Heiser**, office manager.

• **P. B. Goodale** has been named manager of the newly-formed Farm Equipment Section of Worthington Pump & Machinery Corp., at Holyoke, Mass.

• **Gilbert Thiessen** has been appointed technical adviser for the chemical division, Koppers Co. Inc., Pittsburgh. Dr. Thiessen had formerly served as development manager.



E. J. FULLAM, chairman of the board, Fellows Gear Shaper Co.

• **E. J. Fullam** has resigned as president of the Fellows Gear Shaper Co., Springfield, Vt., and has been elected chairman of the board. **E. W. Miller** succeeds Mr. Fullam as president. **R. M. Fellows** has been named first vice-president and treasurer; **C. M. Peter**, vice-president and general manager and **H. T. Gates**, vice-president and factory manager.

• **James R. Longwell**, for the past four years director of engineering and research, Carboly Co., Inc., Detroit, has been named assistant to the president, and **F. C. Ritner** has been appointed vice-president in charge of engineering and research. Mr. Ritner joined the company in 1929.

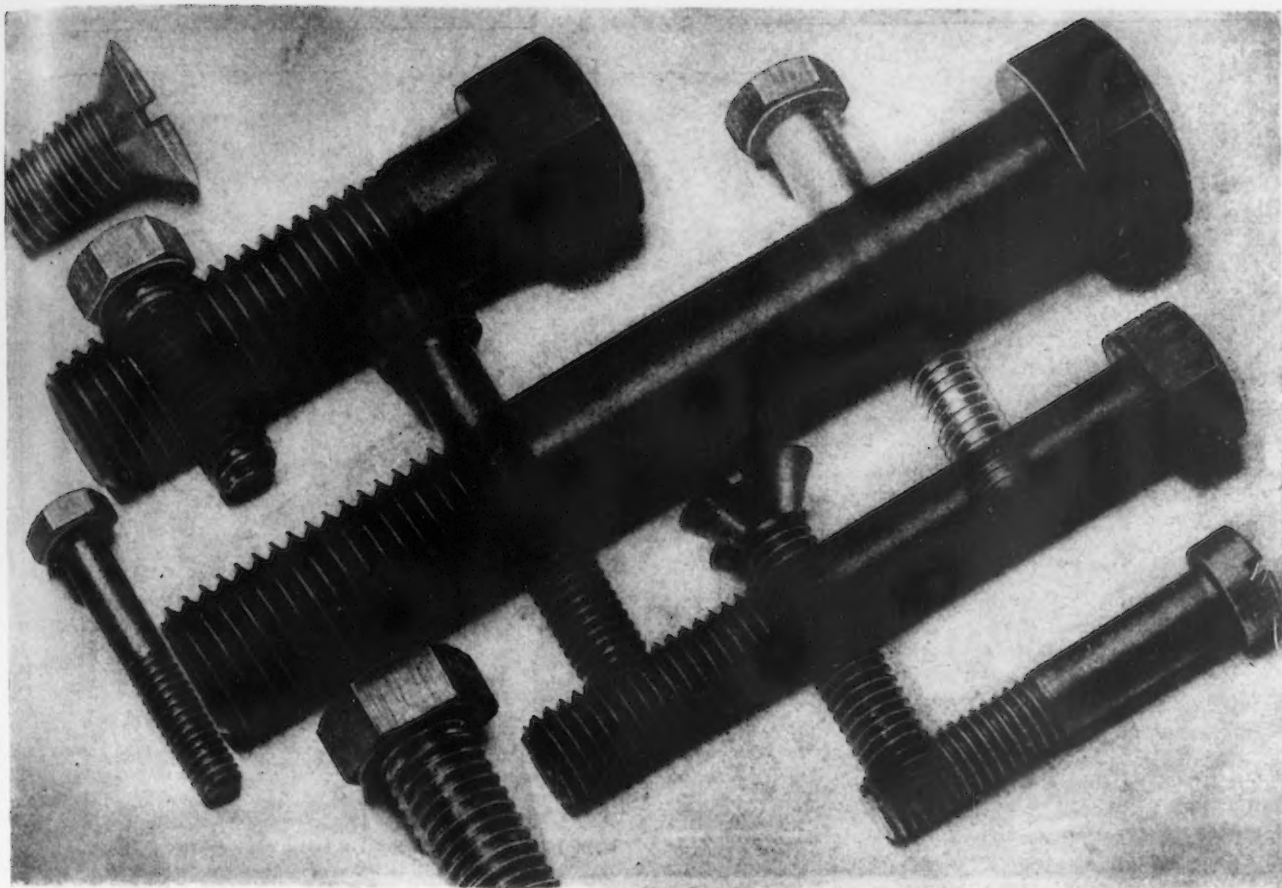
• **James M. Herring** has been named service manager, the Osgood Co., Marion, Ohio. Mr. Herring has been with Osgood since 1928, serving as motor mechanic, electrician and assemblyman. In 1937 he became an operator-erector.

• **Daniel F. Hulgrave** has been named director of the purchasing and salvage section of the Procurement and Schedules Staff of General Motors Corp., Detroit, succeeding **H. L. Dingler**, who has been assigned to other duties. Mr. Hulgrave has been associated with the Cadillac Div. of GM since 1908 and has been manager of purchases since 1912. He is succeeded in the latter capacity by **Raymond A. Vogel**.

• **M. A. King**, formerly manager of engineering, Elliott Co., Jeannette, Pa., has rejoined the company as engineering vice-president of the Jeannette Div. Mr. King, who had previously been with Elliott for 27 years, served as executive engineer for the turbine division of Worthington Pump & Machinery Corp. for the past 5 years.

• **Lewis W. Roe**, statistical supervisor, has been appointed assistant comptroller in charge of costs and statistics for Columbia Steel Co., San Francisco. **Robert B. Freeman** has been named chief metallurgist for the company, succeeding **Gordon L. von Planck**, who has been made metallurgical consultant. Dr. Freeman joined Columbia in 1936 as a metallurgist at the Torrance Works. **Thomas E. Caldwell** succeeds Dr. Freeman as works metallurgist at Pittsburgh. **H. Edward Doleman** has been named assistant to Mr. Caldwell.

• **H. H. Gnuse, Jr.**, has been named a vice-president in charge of engineering for the Nantahala Power & Light Co., Franklin, N. C., an Aluminum Co. of America subsidiary. Mr. Gnuse joined the company in 1940 and in 1942 was made electrical engineer in charge of operations and maintenance of the company's generating, transmission and distribution systems. More recently he has been chief electrical engineer for the power subsidiary.



IT'S "t.f.e."

TO FASTEN QUALITY WITH QUALITY

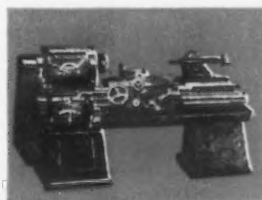
Purpose of a fastener is to fasten. So the cheapest fastener is the one that fastens *best*, with minimum time for assembly, maximum holding power per dollar, and the ultimate contribution to the finished product's appearance.

Manufacturers of machinery and equipment have learned that specifying RB&W Cap Screws saves money all along the line. RB&W's investments in spheroidizing furnaces to improve structure of high carbon and alloy steels . . . mills to draw its own wire to closest tolerances . . . atmospheric-controlled furnaces for scientific heat treatment . . . are as important as the modern production machines in contributing to True Fastener Economy.

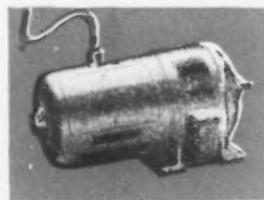
On any problem involving bolts, nuts, screws, rivets or specials, RB&W engineers will help you attain True Fastener Economy.



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103 Years Making Strong the Things That Make America Strong

THE IRON AGE, November 18, 1948—137

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• **Reber C. Stupp**, formerly production chief of Jack & Heintz Precision Industries, Inc., has been appointed manager of the Cleveland plant of the Oliver Corp., succeeding **Robert H. Buckner** who has resigned to become a vice-president of Hupp Car Corp., Detroit.

• **Reginald G. Ullman** has been appointed sales manager, West Steel Casting Co., Cleveland. Mr. Ullman joined West Steel in 1946, following five years with American Car & Foundry Co. in the Cleveland and Pittsburgh sales offices.

• **Frank F. Bonnevier** has been appointed plant superintendent of the Buffalo Stainless Casting Corp., Buffalo. Mr. Bonnevier had formerly been associated with Frederick B. Stevens Co., Detroit, the Cooper Alloy Co., Hillside, N. J. and Allegheny Ludlum Steel Corp., Buffalo.

• **Harry P. Croft** has been named vice-president in charge of development, Wheeling Bronze Casting Co., Wheeling, W. Va. Dr. Croft had formerly been associated with Chase Brass & Copper Co., Inc., as director of technical control and research of the Midwestern Div.

• **Edward C. Nissen** has been appointed special representative for the Cleco Div., Reed Roller Bit Co., Houston. Mr. Nissen is located in San Francisco.

• **A. W. Landel** who has been associated with Connors Steel Co., Birmingham, for the past 15 years, has been appointed manager, construction materials, succeeding **John L. Callaway**, who has resigned to enter his own business as a steel fabricator in Knoxville, Tenn.

• **Stanford P. Bruce** has joined Wheel Trueing Tool Co., Detroit, in charge of the Diamond-Miser Div.

• **E. H. Steger** has been placed in charge of the new Textile Industrial Zone, Sherwin-Williams Co., with headquarters in Charlotte, N. C. **D. S. Shimp** heads the Southeastern Industrial Zone, with headquarters in Atlanta and **J. R. Stevenson** manages the Gulf Industrial Zone at Dallas.



H. W. JOHNSON (left), vice-president in charge of steel manufacturing and P. D. BLOCK, JR. (right), vice-president in charge of raw materials, Inland Steel Co.

• **H. W. Johnson** has been named vice-president in charge of steel manufacturing and **P. D. Block, Jr.**, vice-president in charge of raw materials, Inland Steel Co., Chicago. Mr. Johnson formerly served as staff assistant to the president and Mr. Block had been assistant vice-president.

• **Frank C. Gerhart** has been appointed advertising manager of American Type Founders Sales Corp., Elizabeth, N. J., filling a vacancy created by the death of **Robert B. Huddleston**. Mr. Gerhart had formerly been connected with Champion Paper & Fibre Co., Hamilton, Ohio.

• **Paul E. Butzin** has been named director of engineering, Delta Mfg. Div., Rockwell Mfg. Co., Milwaukee. Mr. Butzin joined the Delta Div. in 1933. In 1942 he joined Milwaukee Gear Co., where he later became works manager.

• **James M. Hackney** has been appointed general manager of the newly-formed dealer sales division of Remington Rand, Inc., New York. **George W. Fotis**, has been named general sales manager of the new division. Mr. Hackney formerly served as general sales manager of the portable typewriter division and Mr. Fotis, director of sales promotion for the typewriter division.

• **Robert E. Seiffert** and **William E. Hendricks** have been named to the board of directors of Belmont Iron Works, Philadelphia, to fill vacancies created by the death of **William C. Smith** and the resignation of **John S. Adelhelm**. Mr. Smith served as vice-president, director, chairman of the executive committee and member of the finance committee. Mr. Adelhelm has been vice-president, director, treasurer, chairman of the executive committee and finance committee. **Sigmund S. Albert** has been appointed chairman and **Harry A. Rowbotham** and **Harold Leonberger** have been appointed members of the executive committee. Mr. Seiffert has been named assistant chief engineer, succeeding **Harry H. Stahl**, who has been promoted to chief engineer. Mr. Stahl in turn succeeds **Joseph G. Shryock**, who is president of the company. Mr. Leonberger, Mr. Rowbotham and **Bennett T. Mial** have been named vice-presidents. Mr. Mial and **Albert W. Schede**, who has also been appointed treasurer, have been appointed to the finance committee. Mr. Hendricks has been named production manager. All appointments are effective Dec. 1.

• **Kenneth C. D. Hickman** has been named consultant to Eastman Kodak Co., Rochester, N. Y. and **Arthur D. Little, Inc.**, Cambridge, Mass.



LYMAN THUNFORS, vice-president and general manager, Paul M. Wiener Foundry Co.

• **Lyman Thunfors** has been appointed vice-president and general manager of the Paul M. Wiener Foundry Co., Muskegon, Mich., succeeding **William G. Grant**, who continues to serve the company in an advisory capacity. Mr. Thunfors had formerly been associated with Richmond Radiator Co., Caterpillar Tractor Co., Muskegon Pattern Shop and Lakey Foundry Pattern Shop.

• **Charles P. Hammond** has been named superintendent of mills of the Rotary Electric Steel Co., Detroit. He formerly served as superintendent of mills with Atlas Steels Ltd., Welland, Ontario, and prior to that was connected with United Alloy, and Crucible Steel Co. of America.

• **Arthur B. Morgan** has been appointed field sales manager and **Elmer Z. Delp**, merchandising manager, New Holland Machine Co., New Holland, Pa.

• **Donald J. Lynn** has been elected a director of General Fireproofing Co., Youngstown, succeeding **Renick M. Bell**, who died.

• **F. G. Morley** has been appointed chairman of the board and **Charles Haskill**, president and treasurer of Great Lakes Engineering Works, River Rouge, Mich.

• **Joe S. Thomas** has been appointed director of purchases and **Charles Beck**, has been named to the newly-created position of manager of raw materials supply, Armco Steel Corp., Middletown, Ohio. Mr. Thomas, who succeeds the late Newman Ebersole, joined Armco in 1927 and has served as assistant director of purchases since 1947. Mr. Beck joined Armco on a full time basis in 1926 and in 1944 was appointed assistant general superintendent of the Middletown Div., the position he held at the time of his new appointment.

• **Clarence C. Walker**, formerly commercial vice-president assigned to customer relations work in the New England area, General Electric Co., has been appointed general manager of the company's Construction Materials Dept., with headquarters in Bridgeport, Conn. Mr. Walker succeeds **Carrol D. Hepler**, who died. **W. J. Woods** has been named manager of the Buffalo office of the company's apparatus department succeeding **George Campbell**, who has retired after 41 years of service. Mr. Woods formerly had charge of the GE Industrial division office in Buffalo.

• **J. T. Gillespie, Jr.** has been named sales manager, Watson-Stillman Co., Roselle, N. J. Mr. Gillespie joined the company in 1944 as director of export sales, in which capacity he remained



GEORGE C. DELP, vice-president, Sperry Corp.

until his appointment to the new post. As part of his new position he continues to supervise the company's export sales.

• **George C. Delp** has been elected a vice-president of the Sperry Corp., New York. Mr. Delp is president of the New Holland Machine Co., New Holland, Pa., a subsidiary of the Sperry Corp.

• **William C. Jordon** has been elected a director of Wright Aeronautical Corp., Wood-Ridge, N. J. engine-building division of the Curtiss-Wright Corp.

OBITUARY...

• **J. William Jay**, 63, advertising manager for Henry Disston & Sons, Inc., Philadelphia, died Oct. 29.

• **Maurice I. Bloch**, owner of Selma Foundry & Machine Co., Selma, Ala., died Nov. 5.

• **Henry T. DeBardeleben**, 74, chairman of the board DeBardeleben Coal Corp., Birmingham, died Nov. 2.

• **Frederick K. Weider**, president, Medina Iron & Brass Co., Medina, N. Y., and president of Barr &

Creelman Plumbing Supply Co., Rochester, died Nov. 6.

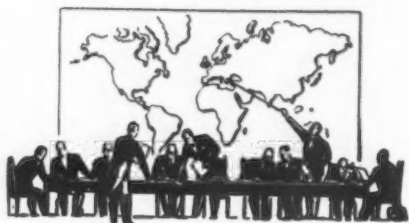
• **Max Meltzer**, 54, vice-president and general manager, Steel Trading Corp., Pittsburgh, died Nov. 3.

• **M. L. Briggs**, former vice-president, Briggs Mfg. Co., Detroit, died Nov. 2.

• **Myrl L. Jacobs**, 63, vice president in charge of raw material properties of Bethlehem Steel Co., died Nov. 13 at the Pan-American Guest House, Trinidad, B.W.I. Graduate of Lehigh University in 1910 with a degree in mining engineering. Appointed vice president and elected to the board of directors of Bethlehem Steel Co. in 1940.

European Letter . . .

• Analysis shows the Chinese Communist fully orthodox . . . Reveals fanatical hostility to America and Western World . . . Corrupt Kuomintang rule and victorious march of communists hold China's destiny at stake.



LONDON—There have been signs for some time that the storm-center of world politics might shift from Europe to the Far East. In Europe, in spite of the continuing tension over Berlin, there has been a certain consolidation of positions on both sides, a transition in the cold war from a campaign of movement to a vigilant defense of fortified lines. It is only in China that at the present moment Communism is advancing victoriously by force of arms. The destiny of a country which holds a fifth of the world's population is at stake in a far-ranging civil war in which both America and Russia are involved, at least morally, as backers of the opposing sides. Britain is relatively uninvolved, having withdrawn from active concern with Chinese affairs ever since China was declared an American strategic sphere during the Pacific war. But no nation can remain unaffected by a threat to the peace of the world such as may at any time arise out of the Chinese civil war, and Britain has already felt its repercussions in the Communist revolt in Malaya, for this rising is almost entirely Chinese and has been partly a projection of the Chinese civil war into Malaya; many more non-Communist Chinese than

Europeans have been killed by the rebels.

The situation which has existed in China since the fall of Mukden to the Communists cannot be merely an internal concern of China, nor in its international implications can it be confined to the interests of America and Russia. There would, indeed, be ample justification for bringing it before the United Nations—were there any ground at all for believing that the United Nations could do anything about it. But whether within the framework of the United Nations or outside it, the Western nations will have to do some hard thinking about China. Their concern with the Chinese crisis, it need hardly be added does not arise out of any assumption of right to supervise China's internal political or economic development or decide what China's national policy is to be. Nor is it primarily because of anxiety over the fate of foreign-owned properties in China; these are legitimate interests to be defended by diplomatic means, but they are not a ground for intervention in China's domestic politics. The reason for alarm at the military advances of the Chinese Com-

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munists lies in their fanatical hostility to America and the Western World and in the probability that a Communist China would be inseparably combined, like Poland or Czechoslovakia, with Russia in an anti-Western bloc, thus bringing about a profoundly important alteration in the world balance of power and opening the way for fresh advances and excursions of militant Communism.

COMMUNISM, triumphant in China, would hardly be contained by China's borders. The wave would pass on into southeast Asia, where there are large Chinese communities in each country; it is significant that the Chinese Communists have followed the example of the Kuomintang in taking special measures for organizing the "Overseas Chinese," and they have the advantage of a doctrine which, unlike pure Chinese nationalism, can influence the native inhabitants while retaining

leadership in Chinese hands. Thus, not merely Manchuria or even North China, but the whole Far East from the Amur to Timor and the Bay of Bengal is at stake in the struggle for the Chinese capital which is now developing.

There has been much controversy about the Chinese Communists, the character and aims of their movement and their relation to the Soviet Union. There has been a great vogue for the view that the Chinese Communists are "not really Communists," but merely radical agrarian reformers with a Chinese version of the faith having little except the name in common with the Moscow brand. It has been inferred as a corollary of this interpretation that a Communist victory in China would make little or no difference to China's foreign relations and that the western nations would be able to do business with the new regime simply on the basis of China's national interests and need for foreign economic aid. Unfortunately this view hardly squares with a scrutiny of Chinese Communist propaganda for home consumption or with the writings in which Chinese Communist leaders have expressed their attitude to world affairs.

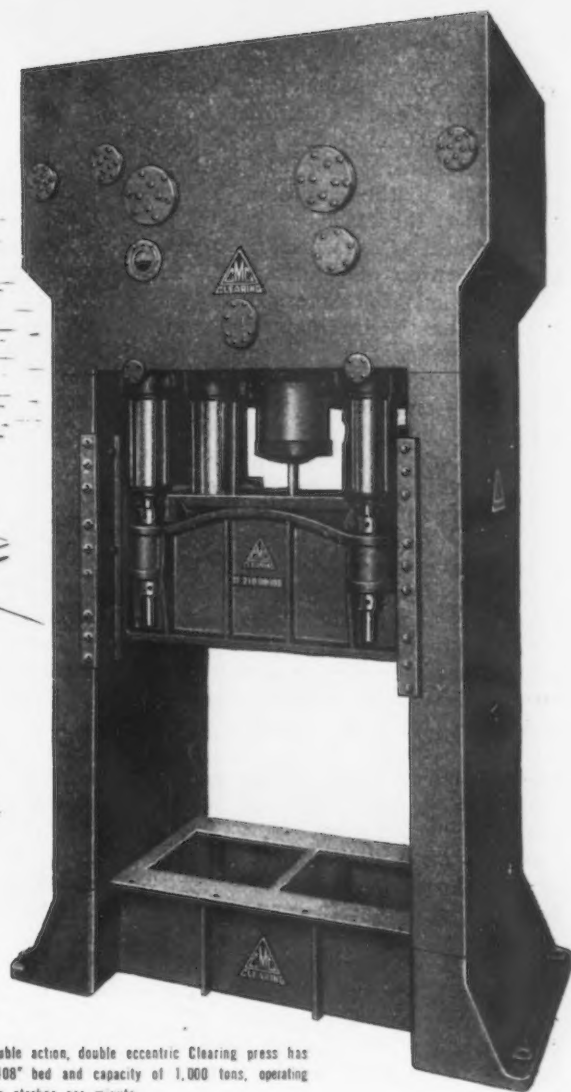
There is nothing to show that the Communists in China, any more than elsewhere—at any rate, as far as their higher leadership is concerned—are merely practical reformers, indifferent to Marxist-Leninist dogma; on the contrary, it is the fanaticism of belief in a revealed doctrine which, combined with a supple tactical skill in the manipulation of social forces, has been the secret of their success. Because of the economic backwardness of China and the course of events which in 1927 drove them from their original bases in the coastal cities, the Communists in China have become more specially identified than in any other country with peasant revolt; they have also gone very far in temporary compromise with capitalism in order to win support among middle-class elements disgusted with the corrupt rule of the Kuomintang.

BUT in their world outlook, and therefore in their foreign policy, as and when control of it can be obtained, the Chinese Commu-

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DAY of RECKONING

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nists are fully orthodox. They know from their Marxist-Leninist bible that imperialism is the final stage of capitalism; America is the strongest of the capitalist states and must therefore be planning the conquest of the world, including the subjection of China. All the denunciations of American imperialism and the instigators of war which pour from the radios of Moscow or Warsaw are echoed in Chinese Communist broadcasting with, if that is possible, even greater venom. If Britain figures less prominently than America among the infernal powers threatening the hard-won independence of the Chinese people, it is not because of any sympathy for the efforts of the British Labor Government to carry out a program rather more socialist than that put forward currently by the Communists for China, but because from a Chinese angle Britain and Europe are hardly in the picture at all.

It may be said that the rabid anti-Americanism of the Chinese Communists is due only to American support for President Chiang Kai-shek and that it would disappear if American policy were to abandon the Nanking regime. However, the Chinese Communist line on foreign policy did not start with the American aid given to the Chinese Government after the surrender of Japan; in 1940 the Communists in China were faithfully following the Moscow directives on the imperialist war which Britain was then waging against Hitler, and Mao Tse-tung's book "The New Democracy," which laid down the principles of Communist political strategy in China, made clear the fundamental alignment of the party on the side of the Soviet Union against all capitalist states. It is possible, indeed, that the Chinese Communists, if once in control of all China, might succumb to "Titoism" and forget their proper devotion to the highest authority of the brave new world; the size of China and the instinctive Chinese ethnic pride would make for insubordination. But western policy cannot safely be based on such a remote chance. It is impossible for the leaders of a state to hold definite *a priori* convictions about the inevitable imperialism of certain other states, and to instill such convictions into the whole people through a monopoly of propaganda, without their foreign policy becoming,

in a large degree, the prisoner of these ideas.

IN these circumstances can there be any doubt that the western Powers, and above all the United States, have an overwhelming interest in sustaining any government which is friendly to the west and opposed to the absorption of China into the Russian orbit? It is not the virtues of Nanking that make support for it imperative. The western Powers have indeed no reason at all to be satisfied with the record of the government which today is attempting to stem the Communist advance. But the nature of the struggle leaves the western Powers no choice. In the circumstances which exist, support for the anti-Communist forces is legitimate and should be inevitable.

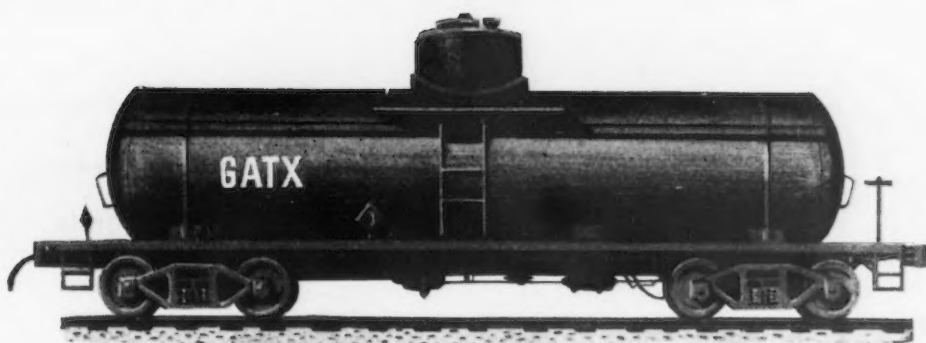
But even if the need to reinforce Nanking is admitted—which is far from the case in Washington where the "plague on both your houses" pronounced by General Marshall 18 months ago still checks the China firsters in Congress and the popular press—and even if the decision were taken to give the Nanking Government sufficient backing to maintain its position, the problem remains of finding some means of doing so. The issue is urgent. It is not a question of long-term support but of stopping the Communist flood within the next few weeks and checking the advance which today threatens the whole Yangtse Valley. Clearly, therefore, it is in this first instance a problem of military supplies and food for the threatened cities. But fundamentally it is a political initiative which is needed. It is manifestly impossible for any situation to be retrieved if the present Nanking regime continues unaltered. Its record of corruption and incompetence is such that it can no longer maintain popular leadership against the Communists. Moreover, it has failed in what is both in the immediate future and in the long run the crucial issue in China—the attitude of the peasant. Military resistance now and stability in the future depend upon agrarian reform. The total failure of the present Government at Nanking to recognize this necessity has ruled it out as a rallying point for Chinese resistance.

Is the situation, therefore, hopeless? Far from it. Upheavals in the Nanking Government may well

come, of themselves, as a result of the military defeats of recent months. But the Americans can accelerate the process by making their aid conditional upon the broadening of the Government by inclusion of some of the liberal statesmen who for the last 18 months have been seeking to break the limpet hold on the power of the Kuomintang Old Guard and chief among them the notorious CC clique. The creation of a new cabinet would permit the Americans to press forward with the two chief needs of the present situation—the distribution of arms not only to the regular forces but also to local armies and defense organizations together with the announcement and where possible the enforcement of drastic changes in the relations between landlord and tenant.

In the south and west of China there are vast areas where Communism as yet appears hardly to have gained a foothold and where resistance under local leadership could certainly be organized if military supplies were available and initiative were no longer cramped by the jealous obstruction of the Nanking bureaucracy. A traveler in Szechwan this summer found considerable enthusiasm for the local self-defense organization—a kind of Home Guard—but was told it could obtain no arms or ammunition from the higher military authorities. This seems to be a common story throughout China and applies not only to local militia units, but also to certain generals who have been effective in fighting the Communists but are not regarded by the Kuomintang ruling clique as quite reliable upholders of the Nanking regime. The time has now come when the American Government, in extending aid to Nanking, should insist that the arms sent are properly distributed to those who are prepared to use them against the Communists.

THE pledge of agrarian reform is as urgent as the proper control of arms distribution. The Communists' sweeping advances are in larger part due to the support they have gained as the champion of the peasant at a time when in Kuomintang China the grip of landlord and moneylender has grown more grievous with the combination of food shortages and inflation.



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Industrial News Summary...

- **Steel Demand Stronger Than Ever**
- **No Falling Off in Orders Seen**
- **Forecasters Now Throw Up Hands**

STEEL demand is not yet ready to fall on its face. Far from it. It may be a long time before it even shows signs of a slowdown. Reports in the past few weeks of easing in steel requirements have been generated by people looking for only that. Such reports have appeared periodically since the end of the war.

The country is closer to a more "normal" flow of steel orders than it was 1, 2 or 3 years ago. But that is all that can be said at this time. There just hasn't been any falling off in total steel business since the election. There has been no change at all in the demand pattern.

If anything, Midwest steel users claim this week that steel is harder to get. How can this be when steel output is higher than it ever was? That's a good question but it is no answer. It may be that all along there has been a steady growth in normal steel demand. Maybe this has been superimposed on top of the so-called filling up of the pipelines.

A check by THE IRON AGE editors fails to find any change in the mood of steel-hungry customers in the East, the Midwest, in Detroit or at the byways and highways of the country. There has been no dropping of expansion programs in the steel industry. The flow of steel orders is wide, strong and appears never-ending. When there are a few holes in mill schedules they are quickly filled.

Forecasters who have tried to name the year, month, day and hour that steel supplies will catch up with steel demand have given up. All forecasts by men in steel and out have been shattered to pieces by the insistent demand for steel. Many of the predictions are now a year or more beyond their time. Some of those made earlier this year are overdue. In the past few months there have been no new ones.

THOSE who said that the Marshall Plan and other exports would continue to hold up steel demand have been only partly right. Everything has been done to see that as much steel as possible went to domestic users in this country. Exports have been less than had been expected—but home demand keeps going at top speed. What would have happened in this country had export steel been given a wide open green light is not hard to guess. Yet, with more steel being made and shipped now than ever before, gray markets flourish, conversion deals are increasing and the people who can't get steel think they are on starvation rations.

Instead of conversion deals (where ingots or semi-finished steel are bought from one source and converted into finished steel products by another) falling off they are picking up—in number and tonnage. Not

only that. There is tough competition in conversion deals between the oil companies and automobile firms. Since ingots lend themselves to products which can be used by either industry, the scrambling by both has taken on a new tempo.

News from the Midwest and Southwest indicates that oil firms are far from satisfied with the amount of steel they are getting—from mills, from conversion or from gray markets. They want more. Many of their planned projects, such as pipeline and expansion programs, are tied up in the steel procurement picture. It is costly to have these jobs retarded. That is why oil companies will pay the money necessary to go through the conversion route for more steel. If they don't do that they don't get the extra steel.

SIX months ago it was said that ingots would be a drug on the market. Those 6 months have passed. Ingots are not now a drug on any market—if they are good quality and the right sizes for big conversion jobs. Prices for ingots in the free market are strong—so strong that spot prices range from \$90 to \$100 or more a ton. By the same token free market plates, skelp and tube rounds for pipe in the conversion market command high prices—to which is added some fancy freight charges.

Steel base prices were still a quiet subject this week but another steel company (Republic Steel Corp.) has revised its extras on hot-rolled sheets and strip. The change may add about \$6 to \$7 a ton to the average price of those products. More companies are studying such extra cards. It would be no cause for surprise if more firms made changes on hot-rolled sheet and strip extras.

The increase of \$6 a ton for rails made by Inland Steel may not turn out to be an isolated price increase. Some makers of rails have been squawking for months about the cost of making that product. They may consider raising rail quotations.

Chances are good that freight car steel allocations will continue through August of next year at least. October freight car output fell 1000 units below the 10,000 goal because of (1) labor trouble at one plant, (2) changeover to a new type of car at another plant and (3) cutbacks by at least four railroads on new car construction to concentrate on repair of old cars.

November freight car output is expected to come close to 10,000 units. It is not expected that much more than the 10,000-car goal will be reached in future months. A labor shortage bottleneck would be reached if output were to be boosted much higher than it is now.

Steel ingot output this week stays at 99.5 pct of capacity. Fluctuations around that figure may be expected, with no sharp drop for some time to come.

• **RAILS UP**—Effective Nov. 15 Inland Steel Co. raised base prices on rails 100 lb and over 30¢ per 100 lb. The new base is \$3.50. At the same time they revised upward the extras on joint bars and standard tee rail sections under 100 lb per linear yd. Weight extras on tee rails went from 2½¢ to 15¢ per 100 lb on rails weighing 100 to 90 lb. On rails weighing from 90 to 75 lb the extra increased from 10¢ to 30¢. Extras on special joint bar sections were doubled. Weight extras on joint bars were increased from 60 to 80 pct, depending on the weight of the section. Wilfred Sykes, president of Inland, said, "For several years the company has sold steel rails without profit. It is our belief that it is not proper for us to exhaust our raw materials and wear out our facilities in producing these commodities without an adequate return for our stockholders."

• **A FREE RIDE**—France is getting a free ride on West Germany's business band wagon. Britain and the United States put up \$1 million of working capital with which the Joint Export-Import Agency, JEIA, handles all foreign trade. Now the French have agreed to join the trade merger, but put up no cash. The other 2 countries feel that their zones will profit by bringing in France sans cash by promoting the flow of goods wherever needed thereby increasing production.

• **FATTER PAYCHECKS**—The iron and steel industry's payroll hit a new monthly record of almost \$200 million in September, according to the American Iron and Steel Institute. Earnings of hourly, piecework and tonnage workers for this month averaged \$1.718 per hr as compared with \$1.689 in August and \$1.645 for July. The average for the first half of 1948 was \$1.562 per hr.

• **PITTSBURGH HO!**—Briggs Manufacturing Co. is earnestly going after a spot in the Pittsburgh district. They contemplate spending several million dollars in relocating if they find the right place. But they come up with the real reason for relocation. Freight savings would be negligible compared with the cost of setting up a completely new operation. But, the chief advantage would come from steadier steel supply that would permit effective and consistent production planning with corresponding cost savings.

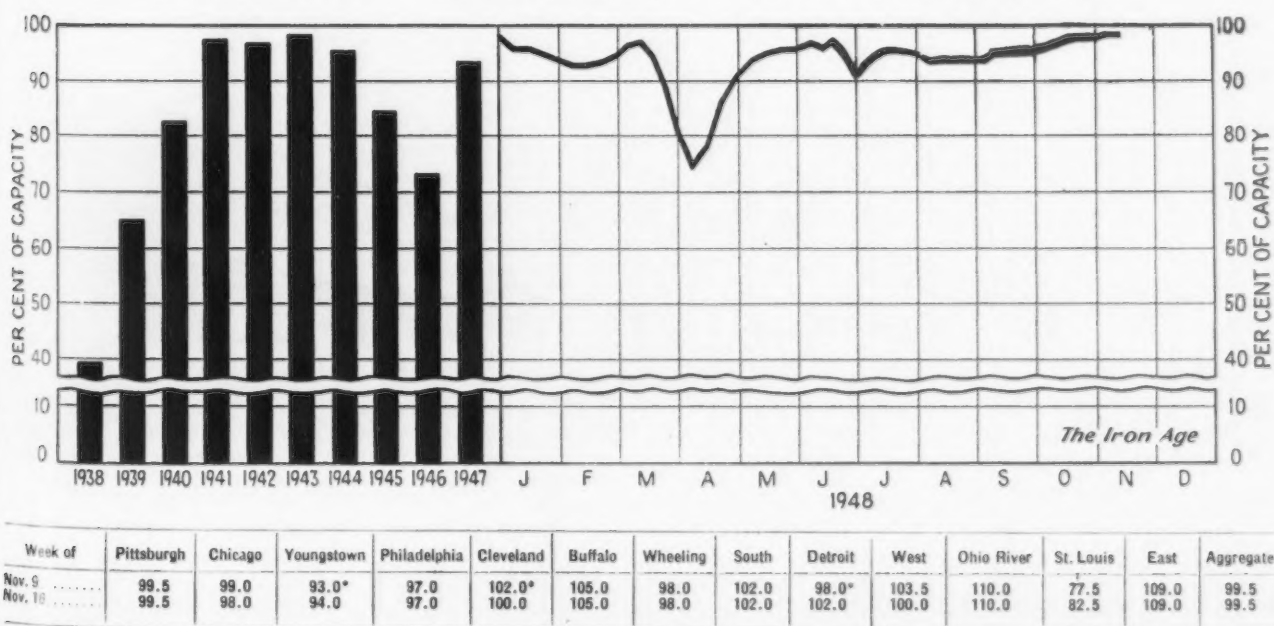
• **ALLOCATIONS CONFAB**—Secretary of Commerce Sawyer has asked the steel industry to come in and talk over the voluntary allocations program on Nov. 19. Purpose of the meeting is to discuss the several steel allocations programs on which action was postponed in October and to consider extending several nondefense steel allocations agreements now in effect beyond Feb. 28. The invitations went to members of the department's steel products advisory committee which decided on Oct. 6 not to meet again.

• **UNDER ONE WING**—U. S. Steel Supply Co., U. S. Steel Corp.'s warehousing subsidiary, will soon be serving steel to consumers in the Pacific northwest, according to L. B. Worthington, president of U. S. Steel Supply. It's merely a different way of performing the service since Columbia Steel Co., another U. S. Steel subsidiary, will turn over its warehouses at Portland and Seattle to U. S. Steel Supply.

• **DEAL STILL ON**—Negotiations for the sale of the Warren, Ohio plant of Copperweld Steel Co. to Borg-Warner Corp., Chicago, were pending at press time. It was believed that the delay was the result of problems involved in the separate lease which Borg-Warner Corp. is setting up with War Assets Administration, on the government-owned facilities at the plant. Announcement was originally scheduled for Monday. In Chicago a spokesman for Borg-Warner Corp. said, "As far as I know, the deal is still on," but declined further comment. Copperweld Steel Co. officials made no comment. [For details see THE IRON AGE, Nov. 11, p. 151.]

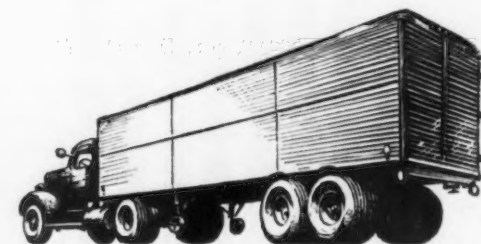
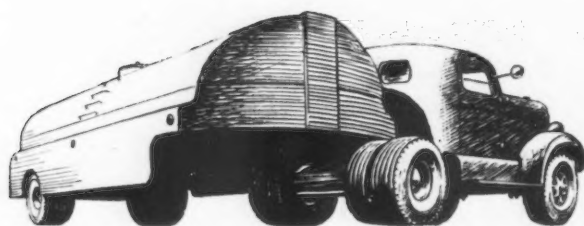
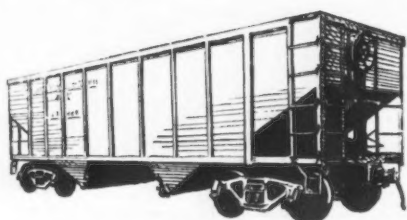
• **CHROME INDEPENDENCE**—A pilot plant to exploit large chrome ore deposits on the West Coast is expected to be in operation within about 30 days, according to Robert D. McCarter, executive vice-president of American Chrome and Magnesium Industries, Inc. Currently 3 plants for processing the ores are contemplated. Total cost will run about \$3 million. The company expects to get about 300,000 tons of chromium metal annually from the plants by the middle of 1950. That would be roughly 30 pct of our present consumption and 20 pct of the world's needs.

Steel Ingot Production by Districts and Per Cent of Capacity



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THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N.Y.

"Rugged is the Word for Steel" Say Harrassed Midwest Consumers

Chicago

• • • **Rugged** is the word for steel. Consumers in the Midwest don't see eye to eye on all the gruesome details but they agree, "steel supplies are tighter than they have ever been." They don't qualify this statement—right now it's worse than they can ever remember.

Mill quotas have been cut by all producers on practically all major products except stainless. Some manufacturers are laying off help in order to balance their working crews with available steel supply. Others are cutting the work day or work week instead of using outright terminations because they feel they must maintain their organization. Nobody is happy, producers included.

Foreign steel has become a factor. In fact the starvation steel diet has caused conversion to cross international boundaries. Sheet bar, plates, billets and bars from Belgium and France are being offered here. What's more, some people are buying them. This steel is foreign made. It's billed as Thomas steel which is their way of saying Bessemer. Because of the high phos these plates and sheets aren't any good for drawing applications. However, in slight forming and straight applications they will work.

The buyers and purchasing agents interviewed by THE IRON AGE are resourceful men. They don't give up easily. They know and use all the angles. So far they have somehow found a way. They didn't invent conversion but they perfected it. As a group they see no relief in sight. They expect the coming months to be even a worse dream.

Narrowing profit margins are holding some consumers from going as far afield to get steel products as they did a year ago. Other companies will gladly take title to plates, sheets or pipe F.O.B. Stalingrad if need be. To this latter group the great hullabaloo over F.O.B. mill is premature and purely academic. They paid the freight before the Cement Case. They'll pay the freight now and "let's cross the bridge we are on

Supplies Are Tighter, Gray Market Is Stronger; But Consumers Find Way

By D. I. BROWN
Chicago Regional Editor

before worrying about the one around the corner."

Pressure for conversion keeps climbing. Ingot and slab makers are on the average 1½ months behind on shipments. Gray market prices are higher. Gray market offers are fewer. Why? There are three reasons—take your pick: (1) The real opportunists have gone into the cement business where larger markups are pos-

sible. (2) They have firmly established their steel outlets and don't offer the same tonnage twice. (3) The brokers' main source of steel, the consumers, aren't willing to part with surplus unbalanced inventories at any price.

Product wise, pipe and plate are tightest. Consumers blame voluntary allocations for the plate shortage. One Chicago mill cut first quarter allotments on all products 20 pct. Plates were the exception. They cut this product 33 1/3 pct.

Mills admit the picture is so foggy they are afraid to promise anything. One Chicago mill only attempts to see one month ahead. Their customers are being given reduced quotas on a monthly basis. These same customers have been forced to tie the delivery of the finished product to mill ship-

Day in and Day Out!



ments. If you have the bars or billets forgers can generally give a one to two-week promise. If the forging company has to supply the steel, however, they will give you a "guesstimate," anywhere from 8 weeks to 6 months.

Some consumers can't understand why the industry can keep breaking production records and yet simultaneously reduce quotas.

Other users, the realists, are more understanding. This group regards a quota merely as a fishing license. Consumers fortunate enough to have qualified on the voluntary allocation plan are doing well. Those who haven't been so lucky are starting to holler for their cut.

Many users have been substituting aluminum for steel where possible. Flat rolled aluminum is just as hard to get as steel. Alcoa cut some customers 40 pct for the first quarter of next year.

One large maker of mechanical tubing cut first quarter allotments by 33 pct. Carbon bars are still tough. Not only hot rolled bars, but in recent weeks cold drawn bar deliveries have slowed up. Cold rolled sheets haven't suffered as much comparatively as have other products—but then they

Here's One Way

• • • On November 9 J. L. Block, vice-president of Inland Steel, wrote all customers telling them that if they found their quota tonnage for any given period exceeded the amount that was actually needed, Inland would like to know. Mr. Block promised that if a customer offered to cut back on deliveries for a month it would not affect the next month's quota. The consumers have been fearful that if they cancelled temporary unneeded tonnages the mills would assume that customer did not need as much steel as he had been getting and that the mills would automatically cut all future quotas by the same amount. Mr. Block's action is commendable. Many believe that if all consumers and mills played ball on this basis, the gray market would contract considerably.

have been like hen's teeth all year.

Hot rolled sheets, 19 gage and lighter, consumers say, are now extinct. Heavy gage hot rolled isn't much better. Some users of strip declare direct mill shipments have dried up. This is particularly true of small consumers.

The mills are making less and less strip, they are driving for tonnage. They ship wide coils to

the warehouses who slit and edge. This means a strip user is in many cases forced to buy these items from warehouses at a high price. This might not be so bad except the warehouses say they don't have any strip either.

Users who jumped into conversion early are in much better shape than those who couldn't afford it, lacked initiative, or were just short sighted. Auto makers are a case in point. To a great extent the oil and gas industry helped themselves in a similar fashion.

One large implement maker made the right arrangements early and is doing relatively well. Yet in these fields desperate cases are found. One ingenious user of seamless pipe got what he needed but he did it the hard way. He bought forging quality ingots, had them forged into rounds, the rounds were rough turned to size and cut into short lengths for piercing mill stock. The ingot maker, forge shop, seamless mill and end destination were all many miles apart—but he got his pipe. Costs? "Don't be silly, we need pipe!"

Where will it stop? None of the men interviewed would risk a guess. They don't know. No steel man knows and Gallup isn't in any shape to find out. One buyer of a large Milwaukee concern ventured this opinion: "The break will come fast, it will be drastic, it will come when least expected." On that basis it could well happen today. Better check, maybe it happened yesterday.

To Build New Type Barges

Pittsburgh

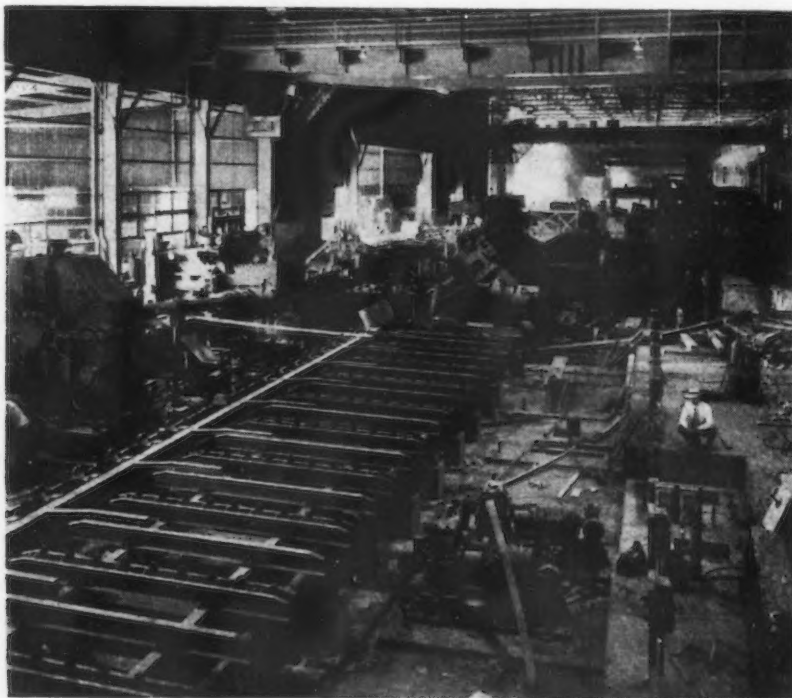
• • • Integrated tank barges of an entirely new design will be built here by Dravo Corp. for Mid-Continent Barge Line Co., Minneapolis, Minn., to transport petroleum products on the inland waterways.

It was said due to design and precision testing, the new hull form of this unit will have the lowest ton-mile resistance of any such fleet built by Dravo Corp.

Each of the two barges will be 240 ft long, 50 ft wide, and 12 ft deep. Together the barges will have a capacity of more than 40,000 bbl of gasoline.

Delivery of the new vessels will be made next spring.

NEW TUBE PROCESS: U. S. Steel is currently constructing a continuous pipe mill at the Lorain, Ohio plant of the National Tube Co. which will turn out seamless pipe at the rate of 2000 fpm. In conventional practice a solid round bar undergoes five separate operations in tube making. The new process combines most of these into one step.



Geneva Steel Co. Is Important Hub In U. S. Steel's West Coast Plans

By TOM CAMPBELL
News-Markets Editor

New York

• • • A man who likes his work is a good producer. But a man who is doing exactly what he wants to do has even more on the ball. And when a man is carrying out plans and dreams he has had for years, then anything is possible.

Dr. Walther Mathesius is running Geneva Steel Co. He was among the first to believe in its possibilities, the one to fight for it and finally the one who ran it in such a way as to justify his own belief. Now everyone is on the bandwagon. It wasn't always that way.

With the help of the Mormon people Mr. Mathesius is well on his way to making a pace setter out of this important subsidiary of U. S. Steel. Its steel production costs make other steel people (within the U. S. Steel Corp. too) a little envious. And well they might be.

Geneva Steel will in years to come be one of the best buys made by U. S. Steel. It already looks that way. It is cold fact though that not too many years ago U. S. Steel directors and top officials felt that future steel consumption possibilities on the West Coast were nothing to write home about.

So much did they think this that they threw cold water on any attempt to build a plant—with their money—in Utah. Not only that but they took so long to make up their minds over whether a plant was even feasible that Henry Kaiser built Fontana. That plant is now one of Geneva's formidable competitors on the West Coast.

One can hardly blame U. S. Steel. Its officials—who had the authority—felt they had good reason to believe that Tennessee Coal, Iron & Railroad Co. would be able to compete with any Utah steel plant. They thought that hot-rolled coils could economically be shipped from

Birmingham to Columbia Steel on the coast and that a West Coast steel plant like Geneva was unnecessary.

The war changed all this. So did growth of the West Coast. Or so it seems now. But up to the last minute corporation people believed that TC&I was the logical source for Columbia's hot-rolled coils. It is now clear that this was definitely not the answer. Depletion of ore reserves, poor coal, changes in freight rate structure and the f.o.b. mill setup are a few other reasons why the Southern mill of U. S. Steel could not do as good a job as Geneva can—and will.

But today all is to the good for U. S. Steel and its Geneva Steel Co. Studies—after the amazing population figures for the West Coast were a fact—show that steel demand there is much greater than all but a few in U. S. Steel thought it would be, only a few years back.

But just as the experts—pessimists in this case—were wrong in the late 30's so may they be wrong this time. Demand on the West Coast may come somewhere near what those exuberant West Coast-ers said it would be back a few years ago. Or it might even match their current talk—that West

Background

New York

• • • Columbia Steel proposed a steel plant in Utah as early as 1922. L. F. Rains and others saw this possibility. Nothing was done about Utah but Columbia grew rapidly. U. S. Steel bought Columbia in 1930.

Although he coasted along for a while, "Ambie" Diehl, sent out west by Big Steel to run Columbia, came to life with a bang in 1935 on the possibilities of an integrated steel plant in Utah. He got the cold shoulder from those in charge of the purse strings at U. S. Steel Corp.

The Utah steel plant came to life again when FDR thought there was not enough steel with which to win the war. That did it.



Dr. Walther Mathesius

Coast people will use everything that Geneva and Fontana can make—and more.

It was the U. S. Government backed by Bill Hauck's (wartime steel capacity adviser) report on steel capacity which sparked the building of Geneva. And it may have been FDR's hunch that a West Coast steel plant would mean more votes that made this plant a *must*.

Even then U. S. Steel was not sold on the idea. But it did agree to build and operate the plant for the government without a fee.

When U. S. Steel built Geneva for the government, plans and construction were the best possible. Latest engineering advances, and more, went into the mill. Future possibilities were molded into the project. The result was one of the best planned mills in the country. Since Geneva had a sound basis for its existence because of raw materials, it is no miracle to those who have seen it grow.

But if the Mormons had turned thumbs down on the plant it would have been a different story. They didn't—thanks to persuasive powers of Walter Mathesius. The Mormons, a sturdy and thrifty tribe, needed the Geneva payroll to pay off farm mortgages. There was another reason why Geneva was lucky to be manned with Mormons—they wanted employment for their young people at home. This was not a reality until Geneva was built.

Geneva's capacity when it was finished in February 1944 was

(CONTINUED ON NEXT PAGE)

Industrial Briefs . . .

• **TO BUILD TOOLS**—In an effort to speed up production of its new four cylinder, medium sized, six passenger automobile, the Fiat Automobile Co. of Turin, Italy, has contracted with the Budd Co., Philadelphia, for the construction of dies, jigs and other tools here.

• **MORE NICKEL**—New Jersey Metals Co., Elizabeth, N. J., has announced the expansion of their plant facilities and equipment to smelt and refine secondary nickel, its alloys and other nickel-bearing products, to meet varied and definite specifications for re-use in the ferrous and nonferrous industries.

• **SMLTERS DIRECTORY**—The 1948 edition of "World's Non-ferrous Smelters and Refineries" has been published recently by Quin Press, Ltd., London, England. This is the first postwar survey of the world's nonferrous smelting and refining industry.

• **GROUP LEADERS**—The Foundry Equipment Manufacturers Assn. has named the following officers to serve during 1949: William L. Dean, Mathews Conveyor Co., Ellwood City, Pa., president; John Hellstrom, American Filter Co., Louisville, vice-president; and Arthur J. Tuscany, Arthur J. Tuscany Organization, Cleveland, executive secretary and treasurer.

• **NEW DEPARTMENT**—Binks Mfg. Co., Chicago, manufacturers of spray painting and water cooling equipment, has established a new customer service department under the direction of Joseph Vokoun. The new department will operate as an independent unit of the company.

• **MOVES**—National headquarters of U. S. Steel Supply Co. were moved to 208 S. LaSalle St., Chicago, affecting only executives and general office per-

sonnel. The warehousing plant and Chicago district operation sales will continue at 1319 Wabansia Ave.

• **GERMAN SCRAP PRICE**—The Joint Export Import Agency has announced that the export price for German cupola cast scrap has been adjusted from \$52.50 to \$45.50 per long ton.

• **SALES OFFICE**—Establishment of a Cincinnati sales office in the Roselawn Center Bldg. and transfer from Indianapolis to Cincinnati of Frank Heap to head an expanded Cincinnati-Indianapolis sales territory has been announced by the Monarch Machine Tool Co., Sidney, Ohio.

• **ELECTS OFFICERS**—The following officers were elected at a recent meeting of the Philadelphia chapter of the Institute of Scrap Iron & Steel, Inc.: Harry Stave, Stave Bros., Philadelphia, president; J. F. Malloy, Malloy & Schreiner, Philadelphia, vice-president; D. J. Giordano, Giordano Waste Material Co., Camden, N. J., treasurer; and Marcus J. Margulies, Luria Steel & Trading Corp., Philadelphia, secretary.

• **TOOL DISTRIBUTOR**—The Geometric Tool Co., New Haven, Conn., has announced the appointment of Wright Industrial Supply Co., 3630 Detroit Ave., Toledo, as its distributor for northwestern Ohio carrying a stock of standard threading tools and chasers.

• **CHANGE OF ADDRESS**—Continental Iron & Metal Co. has recently announced the removal of their office and warehouse to 2635 West Grand Ave., Chicago.

• **STRIKES URANIUM ORE**—Robert Campbell of the Camray Mining Syndicate has recently discovered deposits of uranium ore along the northeastern shore of Lake Superior. Test assays showed the radioactive deposits to be 59.1 pct uranium ore.

(CONTINUED FROM PAGE 149)

1,283,400 net tons of steel in 1948 and 1,150,000 tons of pig iron. The pig iron capacity will probably be unchanged next year. But steel-making capacity will rise to at least 1,373,000 net tons when present plans are completed. There will still be room for another open-hearth furnace. The metallics will be available. So there will probably be another furnace some time in the future.

Geneva is scheduled by 1949 to produce each year a maximum of 350,000 tons of hot-rolled coiled, 500,000 tons of plates and 160,000 tons of structural steel products. With Consolidated Steel, large West Coast fabricator, now being part of the family, it is not hard to guess where a lot of the plates and structurals will go. It is already known that the coils will go to Columbia at Pittsburg for tinplate and Torrence for cold-rolled sheets. A pipe mill for Geneva is a good bet. But not right away.

The U. S. Steel Corp.—as it always does—made up for lost time and for temporary lack of interest once it got going. Its relations on the West Coast, its expenditures out there and the interest shown by its directors means much for the far west.

But it is breathtaking—or should be—to realize how close the corporation came to not getting Geneva. And some people wonder if the same thing will be repeated on the East Coast. Will some other steel company step in and build a big Eastern Seaboard steel plant while U. S. Steel is weighing the pros and cons—even though it has its plans, its ore and its men. The best guess is that Big Steel will get there first.

Net Earnings Reported Up

Detroit

• • • Net earnings for the quarter ended Sept. 30 for Monroe Auto Equipment Co., Monroe, Michigan, totaled \$225,596 after taxes compared with \$155,650 a year ago.

Net sales were \$3,825,304 compared with \$3,047,214 for the first quarter last year.

B. D. McIntyre, president and general manager, explained that a strike extending to 13 full working days and a regular shutdown for inventory are included in the period covered by the report.

Possible Gas Diversion May Hurt Some Pittsburgh Industrial Consumers

By GEORGE F. SULLIVAN
Pittsburgh Regional Editor

Pittsburgh

Some 160 industrial plants in this area face more cold weather natural gas cuts than they planned on this winter. It appears that the Federal Power Commission may set aside a contract under which a Pittsburgh gas company was slated to receive additional natural gas from the Southwest this winter. At least this is likely if FPC follows the recommendations of its staff counsel and one of its examiners.

The case points up the ramifications of the pipeline business, explains in part the demand for steel pipe and tubing and indicates the extent to which Washington can allocate natural gas throughout the country.

The gas diverted would go to points in Missouri, Northern Pennsylvania and New Jersey. Some communities in these localities are not now using natural gas. To supply them would require about 10,000 tons of pipe and tubing.

Following the FPC examiner's report of Oct. 29, recommending that these new applicants be served, a 20-day period is allowed for complaints by those who feel the move would hurt them. FPC expected plenty of complaints. Therefore the proposed diversion may not be fully approved.

The contract that may be set aside was entered into by Consolidated Natural Gas Corp. with Texas Eastern Transmission Corp., owners and operators of the war-built Big Inch and Little Inch lines. Peoples Natural Gas Co., one of three subsidiaries of Consolidated, is one of the three big Pittsburgh gas companies. Consolidated signed up with Texas Eastern for 75 million cu ft of gas daily this winter, over and above the 125 million cu ft it had previously arranged for. Only the 75 million cu ft is now in question.

Peoples estimates its peak demand (it serves part of the Pittsburgh district, and extends to Johnstown and Altoona) at 275

million cu ft on a zero day. The Consolidated system as a whole, with two other subsidiaries serving eastern Ohio and part of New York state, has an estimated peak demand of 1.3 billion cu ft daily on a zero day.

On this basis the 75 million cu ft daily does not look large. But a company spokesman estimates that the addition of 75 million cu ft could make a considerable difference to Pittsburgh industry during long cold spells. Pittsburgh's Mayor Lawrence is convinced of this, sees the potential diversion as a threat to the city's economic life.

The two other principal gas companies here are somewhat concerned. Like Peoples, they now draw on Texas Eastern Transmission Corp. While they have not contracted for any additional volume from this source they fear they won't be able to if they want to.

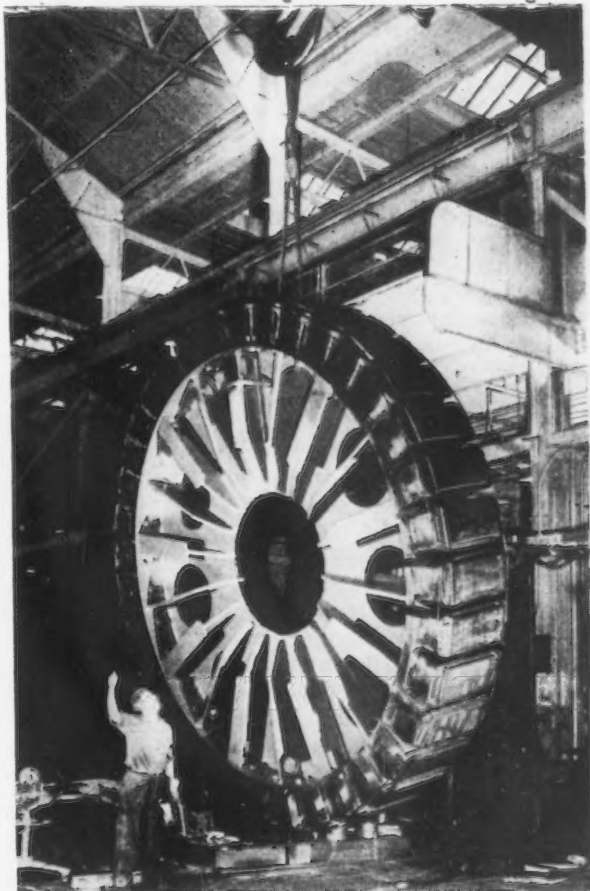
There has been no comment on

the fact that the Big and Little Inch lines must, under the terms of the purchase contract with the Government, be kept in condition to pump oil in case of a national emergency.

If FPC approves the examiner's decision in authorizing the new service, less than 10 miles of new 6-in. line would be needed in Indiana and about 110 miles of 8 and 10-in. in New Jersey. For the Missouri part of the project the requirements are estimated at: 14.25 miles 8-in.; 44 miles 6-in.; 20.75 miles 4-in.; and 10.5 miles 2-in.; all for transmission lines. Some additional footage would be needed for distribution. This totals over 10,000 tons of pipe, though the figure, being an estimate based on probable wall thicknesses, could be as much as 10 pct lower.

Against the nearly 5 million tons of pipe for gas lines planned or being built throughout the country the 10,000 tons involved in this case is small potatoes. What industry officials consider significant is that the government may be stepping in to allocate gas. If it allocates gas, may it also allocate the pipe to supply it?

A BIG WHEEL:
A large rotor of a diesel-driven generator is being lifted from the floor of the General Electric Co.'s Schnectady plant. The rotor which is over 14 ft in diam is part of one of the six generators to be used to generate electricity for Mexico City.



Small Business Committee Sets Up Criteria for Identifying Distress Cases

o o o

Washington

••• How badly in need of steel do customers of mills have to be before Uncle Sam will lend a hand?

Notwithstanding that there are as many answers to this question as there are steel customers, a Senate committee last week jumped into this controversy with both feet and came up with its own answer.

Working on the theory that "you can't tell the players without a program," the Senate Small Business Committee has decided that Washington can't tell a "distress case" among manufacturers of farm implements without a set of criteria.

Here are the committee's criteria for identifying a "distress case":

(1) Are your total receipts of steel for 1948 substantially (15 pct) below 1947 receipts? Calculation of 1948 annual purchases is to be based on purchases listed in an accompanying questionnaire.

(2) Is a substantial and increasing proportion of your steel being procured from gray market sources? Any proportion over 10 pct of total purchases is considered excessive. Or,

(3) Has your employment been materially reduced in 1948 as compared with 1947? A reduction of 10 pct is considered evidence of distress. And/or,

(4) Can you submit written evidence to the effect that suppliers of steel during the first half of 1948 have refused to accept orders for the last half of 1948?

(5) Can you show that you are primarily a manufacturer of farm machinery and or equipment?

Now, if you are still in the running at this point, the Senate Small Business Committee will take your case to prospective suppliers. After that, it's up to the Agricultural Equipment Industry Advisory Committee to decide whether you'll get all or any part of the steel you claim you need.

Here's the form which is now being distributed by Senator Wherry, R., Neb., Small Business Committee chairman, to hard-

pressed farm equipment manufacturers:

(1) The applicant authorizes the committee to present to potential suppliers, either in the Agricultural Equipment Industry Advisory Committee, or the Steel Products Industry Advisory Committee, the steel requirements of his firm for the next 3 months as designated below.

(2) The applicant certifies that the steel requested herein is to be used only for the manufacture of agricultural equipment. The principal products of the company are: (list them).

(3) The applicant agrees that when the quantities of steel requested in this application have

been received or when firm commitments for the supply have been made, the suppliers of the steel and the Senate Small Business Committee will be so notified.

All of this may be very interesting—for the farm equipment producers. But the implications of this new program are legion. The farm machinery people today are on the receiving end of what may be construed as a priority system without any force of law. Granted, Senator Wherry has a special regional interest in the farm machinery industry. While this latest step may or may not establish a precedent for other industries, it is a significant step and one well worth noting for whatever ammunition it affords in the coming congressional debate over mandatory priorities and controls.

SENATE SMALL BUSINESS COMMITTEE FORM

Types of Steel Needed	Tonnage Required in Each Type	Gauges & Dimensions
Plates
Bars, Hot Rolled
Bars, Cold Rolled
Pipe, Butt Weld
Tubes, Seamless
Tubes, Mechanical and Pressure
Sheets, Hot Rolled
Sheets, Cold Rolled
Sheets, Galvanized
Strip, Hot Rolled
Strip, Cold Rolled
Other

STRIKE INSTIGATOR: This Fellows Gear Shaper which cuts 60 gears an hr recently caused a strike of 15,500 workers at the Austin Motor Works in Britain.



October Steel Output Largest in History For a Single Month

New York

• • • More steel was produced in October in the United States than in any previous month during war or peace, according to the American Iron and Steel Institute.

The production of ingots and steel for castings during October totaled 7,973,416 net tons, exceeding the previous peak in March 1944 by more than 147,000 tons, the institute reports.

Output of steel in 10 months of 1948 was 72,960,936 tons, nearly 2,700,000 tons higher than in the similar part of 1947, record peacetime production year and only 3 pct lower than the output in 10 months of 1944, year of greatest steel production.

Steelmaking furnaces were operated at an average of 99.9 pct of ingot capacity in October, highest operating rate since October 1943. In September, the rate was 96.1 pct and the average for 9 months was 92.1 pct. Openhearth and electric furnaces were each operated at slightly above rated capacity.

October was the sixth consecutive month in which steel production exceeded 7 million tons, the longest such period since 1944. The output of October was more than 365,000 tons larger than that of March 1948, the previous record

postwar production month, the institute said.

[THE IRON AGE has previously estimated that 1948 steel production will equal 88 million tons.]

Iron and Steel Exports At New Monthly Low

Washington

• • • Continuing a down trend, the volume of iron and steel exports reached a new monthly low in August. According to the Dept. of Commerce, the month's export tonnage amounted to 308,484, nearly 12,000 tons below the previous low of 320,190 net tons in July.

Total exports for the first 8 months of 1948 thus reached a figure of 3,086,082 tons as of the end of August.

Net tonnages exported during August were: ingots, blooms, billets, slabs, and sheet bars, 14,380, a drop of 4000 over July; wire rods, 2814, a slight increase; skelp, 7061, more than triple increase; and pipe and tubes, 58,083, a rise of 13,000 tons over July.

August export tonnages, by commodity, were: iron bars, 70; concrete reinforcement bars, 10,547; steel bars, cold finished, 4091; other steel bars (excluding alloy), 21,606; alloy steel bars, 2672; welding rods, electric, 966.

Boiler plate, 2293; other plates, not fab, 23,443; plates, fab., punched or shaped, 1642; iron sheets, black, 829; steel sheets, black, 27,419; galvanized sheets, 4289; strip steel, cold rolled, 4727; strip steel, hot rolled, 4366; tinplate and tagger's tin, 38,468; terne plate (incl. long ternes), 574.

Structural shapes, plain, 19,946; structural shapes, fab., 9194; frame and sashes, 210; sheet piling, 1840.

Rails, 60 lbs. per yd. and over, 11,326; rails, less than 60 lbs. per yd., 572; rails, relaying, 4231; splice bars and tie plates, 1730; frogs and switches, 414; railroad spikes, 659; rail-

road bolts, nuts, and washers, 394; car wheels, tires and axles, 2158.

Seamless black pipe, 2044; seamless casing and oil line pipe, 16,917; seamless boiler tubes, 2588; welded black pipe, 4512; welded galvanized pipe, 2774; welded casing and oil line pipe, 23,759; welded boiler tubes, 43; other pipe and fittings, 5946.

Plain wire, 4937; galvanized wire, 3801; barbed wire, 1698; woven wire fencing, 550; woven wire screen cloth, 452; wire rope and strand, 1147; wire nails, 1518; other wire and manufactures, 3180.

Horseshoe nails, 10; tacks, 249; other nails, incl. staples, 742; bolts, nuts, rivets and washers, except railroad, 4470; forgings, 2108; horseshoes, 88.

Canadian Output Of Ingots and Castings Lower in September

Toronto

• • • Canadian production of steel ingots and castings in September amounted to 257,856 net tons which was an average daily rate of 82.7 pct of rated capacity as compared with 263,054 tons in August when the average was at the rate of 81.6 pct, and with 234,188 tons or 75.1 pct for September, 1947. Output for the month under review included 248,622 tons of steel ingots and 9243 tons of steel castings.

Charges to steel furnaces in September included 137,865 tons of pig iron; 77,084 tons of scrap of consumers' own make and 67,686 tons of purchased scrap.

For the first 9 months this year production of steel ingots and castings totaled 2,361,387 net tons, which compares with 2,183,564 tons in the 1947 period and 1,750,846 tons in 1946.

Following are comparative monthly figures for steel ingots and castings for 1948 in net tons:

	STEEL INGOTS	CASTINGS
January	247,768	8,958
February	230,183	9,463
March	275,349	10,677
April	254,315	9,951
May	279,688	9,879
June	249,710	9,655
July	238,104	6,768
August	254,362	8,692
September	248,622	9,243
Total 9 Months ..	2,278,101	83,256

Net Profit Replaces Loss

Detroit

• • • Net profit of F. L. Jacobs Co., automotive parts and household appliance manufacturer, totaled \$409,838 for the fiscal year ended July 31, 1948. A net loss of \$219,786 was reported for the same period a year ago.

Consolidated net sales aggregated \$37,085,326 compared with \$32,888,048 in the preceding fiscal year.

POWERED TAKE-OFFS: Heavy duty Dart trucks such as this have been equipped with twin disk hydraulic power take-offs. They are used to haul 20-ton loads of iron ore from the open-cut pits of the Mesabi range.



Testimony Favors Congressional Action On Basing Point Issue

Washington

• • • The Senate Subcommittee on Trade Policies is concluding its second week of hearings on the issue of delivered prices versus f.o.b. selling. And the record of testimony thus far clearly indicates overwhelming sentiment favoring congressional clarification of recent court and administrative decisions on this important issue.

But despite the volume of testimony in favor of such legislative clarification, it is problematical whether the new Congress actually will give the stamp of legality to any of the proposals now being made to the subcommittee.

For one thing, the 1948 court decisions which appear to make illegal various systems of delivered prices represent the culmination of a long campaign waged by the Federal Trade Commission. It is difficult to see how a Democratic Congress and a Democratic Administration will legislate the defeat of this campaign.

The issue has long since become an academic controversy as far as two of the most important industries in the nation—steel and cement—are concerned. However, these two industries have a vested interest in the controversy, since delivered price systems still are in effect for a score of other industries.

While the basic purpose of the

But Doubt is Expressed That New Congress Will Act On Pricing Method

By GEORGE BAKER
Washington Bureau

hearings as they now are being conducted by Senator Capehart, R., Ind., is simply to afford business and industry the opportunity to tell Congress how they feel on the subject of delivered prices, the hearings also have served to point up several important side issues.

One of the most important of these is the difference of opinion within the Federal Trade Commission as to just which selling practices are legal and which are not. To put it bluntly, the difference of opinion is sharply marked.

Walter B. Wooden, associate general counsel of FTC and longtime advocate of f.o.b. selling for all industries, told the subcommittee that the alleged confusion, uncertainty, and fear created by the recent decisions was greatly exaggerated. What actually is taking place, he said, is the recurrence of "a powerful drive to emasculate the antitrust laws on the ground that they are so vague and uncertain that business does not and cannot

know what the law requires or else that the law is basically irreconcilable with business necessities."

He said he saw no way in which delivered price systems could be legalized by Congress without making it "decidedly easier" for price-fixing conspiracies to operate and "decidedly more difficult" for the Federal Government to break them up.

"I cannot believe that this subcommittee will propose, or that Congress will enact, legislation which would involve even a reasonably probable danger of encouraging price-fixing conspiracies by legalizing a pricing method which the Supreme Court found to be 'a handy instrument to bring about elimination of any kind of price competition.'"

But Lynn C. Paulson, assistant chief trial counsel for FTC and presently trial counsel in the Commission's complaint against the use of the basing point system as it formerly was applied in the steel industry, said he could not see the need of proceeding upon an individual basis against freight absorption in order to destroy price-fixing. "I think there is danger to the competitive system in placing too many restrictions on competing," he declared.

Mr. Paulson struck at the prevailing FTC view as expressed by Mr. Wooden that f.o.b. selling is the only safe sales method for industry to apply. "As to what the law on basing point selling is today, I would say that the net result of decided cases is that sellers who have been convicted of price-fixing, or suppression of competition by discriminating in price pursuant to a basing point plan, must thereafter have a plant price at their plants which is not fictitious and offer to sell at that price when requested. It goes no further," he asserted.

"The Supreme Court in the cement case in the last analysis did not do more than say that the respondents in that case had combined and conspired to suppress competition," he continued. "It did not base its judgment on the fact that respondents used or practiced freight absorption but upon the

Coming Events

- Nov. 28-Dec. 3 American Society of Mechanical Engineers, annual meeting, New York.
- Nov. 29-Dec. 4 National Exposition of Power & Mechanical Engineering, New York.
- Dec. 2-4 Society for Experimental Stress Analysis, annual meeting, New York.
- Dec. 2-4 American Institute of Mining & Metallurgical Engineers, annual electric furnace steel conference, Pittsburgh.
- Dec. 2-4 American Metallizing Contractors Assn., annual meeting, Tulsa, Okla.
- Dec. 3 Magnesium Assn. and Mellon Institute, magnesium meeting, Pittsburgh.
- Dec. 6-8 Electric Welding Conference, Detroit.
- 1949
- Jan. 10-14 Society of Automotive Engineers, annual meeting, Detroit.
- Jan. 10-14 Material Handling Institute and American Society of Mechanical Engineers, Materials Handling Show, Philadelphia.
- Jan. 14 Malleable Founders' Society, semiannual meeting, Cleveland.
- Jan. 24-28 American Society of Heating & Ventilating Engineers, annual meeting, Chicago.

record of combination in its entirety.

"Again I say the net result of the court decisions is to advise sellers that they must have a plant price at every plant and offer to sell f.o.b. mill when requested, if they wish to discriminate in price and match competitors' prices. That is where the matter should come to rest unless and until the facts justify additional corrective action," he stated.

More than a score of businessmen told the subcommittee that changeovers from delivered price selling to f.o.b. selling would cause serious damage to their industries and to the geographic areas in which their plants are situated. Among those who presented their views to the subcommittee were:

John Hancock, New York, N. Y.; William Schoenberg, United Cement Lime & Gypsum Workers; DeWitt Emery, National Small Business Men's Assn.; Clark S. Beardslee, Chemical Sales Corp.; J. H. Collier, The Steelduct Co.; W. H. Reams, Reams Lumber Co.; Don L. Davis, Aetna Plywood & Veneer Co.; C. A. Winslow; Brig. Gen. Paul F. Yount, Transportation Corps; Frank R. Nichols, Nichols Wire & Aluminum Co.; W. H. Schleuter, Schleuter Manufacturing Co.; H. O. Anderson, Rockbestos Products Corp.; H. Olden, Cincinnati Sheet Metal & Roofing Co.; Dwight Winkelman, Associated General Contractors of America; L. Aronstan, Southern GF Co., Inc.; John H. Congdon, Congdon Carpenter Co.; J. E. Eckstein, Eckstein Co.; M. G. Ensinger, Union Wire Rope Corp.; Everett F. Merrill, Merrill & Usher Co.

PEI Elects Officers At Chicago Meeting

Chicago

••• C. D. Clawson, president of Ferro Enamel Corp., Cleveland, was elected to a second term as president of the Porcelain Enamel Institute at the Institute's 17th Annual Meeting held recently at Hotel Stevens, Chicago.

Newly elected to the office of vice-president of the institute were T. G. Harris, Porcelain Steel Corp., Connersville, Ind., and R. A. Dadisman, Armco Steel Corp., Middletown, Ohio.

U. S. Steel's German Scrap

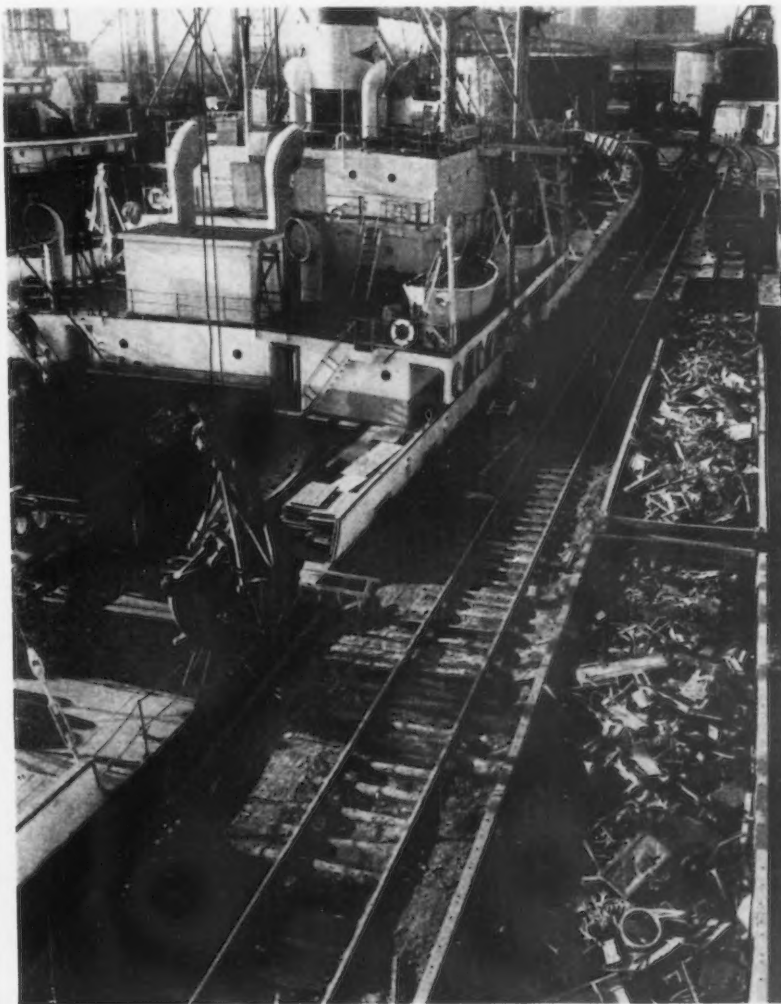
Philadelphia

••• The *Louis Pasteur* docked here recently with 9438 tons of No. 1 heavy melting scrap from Germany for the Pittsburgh district mills of the U. S. Steel Corp. This is the first shipment of German steel scrap under the contract drawn up last May by Carnegie-Illinois with the Scrap Iron and Steel Import Corp.

Currently the scrap is being assembled in Germany at the rate of about 20,000 tons a month. It is hoped that this rate can be increased to 40,000 tons a month so that the 120,000 tons originally contracted for will be at German seaboard ports before the German rivers freeze over this winter.

It is believed in scrap circles that when the final agreements are made between Great Britain and the United States, this 120,000 tons will not be charged against the current United States immediate allocation of 375,000 tons or the additional 125,000 tons credited to future allocations.

Since the original contract drawn up between Carnegie-Illinois and the Scrap Iron and Steel Import Corp., Carnegie has obtained options on an additional 80,000 tons of German scrap. This additional tonnage will of necessity have to be worked in against current United States allocations—as will the 150,000 tons the Bethlehem Steel Co. is now in the process of contracting for. Previously Bethlehem had received 50,000 tons of German scrap, which also, like the first Carnegie contract, is not expected to be credited against the present allocation agreement.



AMERICAN IRON AND STEEL INSTITUTE

Production of Open Hearth, Bessemer and Electric Steel Ingots and Steel for Castings

YEAR 1948

(Preliminary)

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January	6,768,497	95.5	343,169	77.5	361,110	79.0	7,472,776	93.6	1,686,857	4.43
February	6,245,338	94.3	340,596	82.3	354,270	82.9	6,940,204	93.0	1,676,378	4.14
March	6,841,578	96.6	363,235	82.0	403,322	88.2	7,608,135	95.3	1,717,412	4.43
1st Quarter	19,855,413	95.5	1,047,000	80.6	1,118,702	83.4	22,021,115	94.0	1,693,932	13.00
April	5,640,168	82.2	185,089	43.2	392,900	88.7	6,218,157	80.4	1,449,454	4.29
May	6,799,289	96.0	355,562	80.3	416,801	91.1	7,571,652	94.8	1,709,177	4.43
June	6,481,879	94.5	356,810	83.2	417,665	94.3	7,256,354	93.8	1,691,458	4.29
2nd Quarter	18,921,336	90.9	897,461	69.0	1,227,366	91.4	21,046,163	89.7	1,617,691	13.01
1st 6 months	38,776,749	93.2	1,944,461	74.8	2,346,068	87.4	43,067,278	91.9	1,655,797	26.01
* July	6,346,423	89.8	324,991	73.6	395,610	86.7	7,067,024	88.7	1,598,874	4.42
August	6,631,157	93.6	371,205	83.8	435,246	95.2	7,437,608	93.1	1,678,918	4.43
* September	6,592,226	96.3	387,153	90.5	436,231	98.7	7,415,610	96.1	1,732,619	4.28
* 3rd Quarter	19,569,806	93.2	1,083,349	82.5	1,267,087	93.5	21,920,242	92.6	1,669,478	13.13
* 9 months	58,346,555	93.2	3,027,810	77.4	3,613,155	89.4	64,987,520	92.1	1,660,386	39.14
† October	7,099,532	100.2	409,545	92.5	464,339	101.5	7,973,416	99.9	1,799,868	4.43
November									4.29	
December									4.42	
4th Quarter									13.14	
2nd 6 months									26.27	
Total									52.28	

Note—The percentages of capacity operated are calculated on weekly capacities of 1,599,286 net tons open hearth, 99,962 net tons Bessemer and 103,228 net tons electric ingots and steel for castings, total 1,802,476 net tons; based on annual capacities as of January 1, 1948 as follows: Open hearth 83,610,690 net tons, Bessemer 5,226,000 net tons, Electric 5,396,770 net tons, total 94,233,460 net tons.

* Revised.

† Preliminary figures, subject to revision.

PRINTED IN U.S.A.

YEAR 1947

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January	6,550,058	95.2	384,096	87.7	288,458	66.9	7,222,612	93.2	1,630,386	4.43
February	5,835,018	93.9	314,912	79.6	280,471	72.0	6,430,401	91.9	1,607,600	4.00
March	6,619,641	96.2	378,893	86.5	318,440	73.8	7,316,974	94.4	1,651,687	4.43
1st Quarter	19,004,717	95.1	1,077,901	84.8	887,369	70.9	20,969,987	93.2	1,630,637	12.86
April	6,365,670	95.5	375,675	88.6	310,497	74.3	7,051,842	93.9	1,643,786	4.29
May	6,640,004	96.5	372,878	85.2	326,132	75.6	7,339,014	94.7	1,656,662	4.43
June	6,317,705	94.8	351,247	82.8	308,762	73.9	6,977,714	92.9	1,626,507	4.29
2nd Quarter	19,323,379	95.6	1,099,800	85.5	945,391	74.6	21,368,570	93.9	1,642,473	13.01
1st 6 Months	38,328,096	95.4	2,177,701	85.2	1,832,760	72.8	42,338,557	93.5	1,636,589	25.87
July	6,033,512	87.9	256,125	58.6	289,048	67.2	6,578,685	85.1	1,488,390	4.42
August	6,329,497	92.0	346,033	79.0	315,622	73.2	6,991,152	90.2	1,578,138	4.43
September	6,152,348	92.5	334,425	79.0	310,684	74.6	6,797,457	90.8	1,588,191	4.28
3rd Quarter	18,515,357	90.8	936,583	72.2	915,354	71.6	20,367,294	88.6	1,551,203	13.13
9 Months	56,843,453	93.8	3,114,284	80.8	2,748,114	72.4	62,705,851	91.9	1,607,842	39.00
October	6,831,984	99.3	384,272	87.8	353,896	82.1	7,570,152	97.7	1,708,838	4.43
November	6,543,390	98.2	360,620	85.0	338,417	81.0	7,242,427	96.5	1,688,211	4.29
December	6,654,966	96.9	373,367	85.5	347,308	80.7	7,375,641	95.4	1,668,697	4.42
4th Quarter	20,030,340	98.1	1,118,259	86.1	1,039,621	81.3	22,188,220	96.5	1,688,601	13.14
2nd 6 months	38,545,697	94.4	2,054,842	79.1	1,954,975	76.4	42,555,514	92.6	1,619,928	26.27
Total	76,873,793	94.9	4,232,543	82.1	3,787,735	74.6	84,894,071	93.0	1,628,195	52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,553,721 net tons open hearth, 98,849 net tons Bessemer and 97,358 net tons electric ingots and steel for castings, total 1,749,928 net tons; based on annual capacities as of January 1, 1947 as follows: Open hearth 81,010,990 net tons, Bessemer 5,154,000 net tons, Electric 5,076,240 net tons, total 91,241,230 net tons.

Construction Steel . . .

• • • Fabricated steel awards this week included the following:

- 2600 Tons, Cincinnati, transmission towers for Cincinnati Gas & Electric Co. to American Bridge Co., Pittsburgh.
- 2500 Tons, Allentown, Pa., transmission towers through Stone & Webster Engineering Corp. to Lehigh Structural Steel Co., Allentown, Pa.
- 2480 Tons, Cleveland, welded trusses and beams for the Austin Co., Cleveland, to American Bridge Co., Pittsburgh.
- 1800 Tons, Ukiah, Calif., building for Masonite Corp., through Barrett & Hilp to Herrick Iron Works, Oakland, Calif.
- 625 Tons, Boston, Beth Israel Hospital, new main building and service building through Volpe Construction Co., Malden, Mass., to Bethlehem Steel Co., Inc., Bethlehem.
- 325 Tons, Apache Co., Ariz., Box Canyon bridge, through Vinson Construction Co. to American Bridge Co., Pittsburgh.
- 260 Tons, Deferiet, N. Y., steel frame conveyors for St. Regis Paper Co. through Charles T. Main Inc., Boston, to Groisser & Shlager Iron Works, Somerville, Mass.
- 175 Tons, Great Neck, N. Y., Temple Israel. Awarded to Grand Iron Works, New York.
- 160 Tons, Weston, Mass., new Weston High School, through Farina Bros., Newton, Mass., to West End Iron Works, Cambridge, Mass.
- 110 Tons, Salem, Mass., St. Joseph's Church through Gourdeau Construction Co., Salem to West End Iron Works, Cambridge Mass.
- 100 Tons, Everett, Mass., new Everett High School stadium through Platt Constructing Co., Cambridge, Mass., to West End Iron Works, Cambridge, Mass.
- 100 Tons, Boston, shoe factory for Green Shoe Co. through Canter Construction Co. to West End Iron Works, Cambridge, Mass.
- 100 Tons, Macon, Ga., margarine and mayonnaise plant for Durkee Famous Foods, to Ingalls Iron Works Co., Birmingham, through Rust Engineering Co., Birmingham and Pittsburgh.

• • • Fabricated steel inquiries this week included the following:

- 1044 Tons, Kitsap Co., Wash., Pt. Washington Narrows bridge, Director of Highways, Olympia, bids to Nov. 19.
- 1000 Tons, Wildwood, N. J., Grassy Sound Bridge, New Jersey Dept. of Highways, due Nov. 30.
- 561 Tons, Los Angeles, overcrossing on Hollywood Parkway at Western Ave., Calif. Div. of Highways, Los Angeles, bids to Dec. 9.
- 300 Tons, Scranton, Pa., school building, due Nov. 22.
- 253 Tons, Kittitas Co., Wash., Cle Elum River bridge, Director of Highways, Olympia, bids to Nov. 19.

• • • Reinforcing bar awards this week included the following:

- 4000 Tons, Grand Coulee, Wash., construction at Grand Coulee Dam, Bureau of Reclamation, Spec. 2329, through Morrison-Knudsen Co., Inc., to Gilmore Steel & Supply Co.
- 2000 Tons, Garrison, N. D., Garrison dam project through U. S. Engineers to Carnegie Illinois Steel Corp., Pittsburgh.
- 900 Tons, Quincy, Mass., 4 sludge tanks for Metropolitan District Commission through Farina Bros., Newton, Mass., to Concrete Steel Co., Boston.

700 Tons, Seattle, Veterans Administration Hospital, through Sound Construction & Engineering Co. to Bethlehem Steel Co., Inc., Bethlehem.

600 Tons, Boston, Beth Israel Hospital, new main building and new service building through Volpe Construction Co., Malden, Mass., to Bethlehem Steel Co., Inc., Bethlehem, Pa.

120 Tons, Durham, N. H., new engineering building for the University of New Hampshire through Volpe Construction Co., Malden, Mass., to Truscon Steel Co., South Boston, Mass.

• • • Reinforcing bar inquiries this week included the following:

3500 Tons, Garrison, N. D., Garrison dam project through U. S. Engineers, Bids close Dec. 1.

590 Tons, Cook Co., Ill., State highway bridge 263-0202-1-2, Bids closed Nov. 9, Thomas McQueen Construction Co. low bidder.

235 Tons, Los Angeles, overcrossing on Hollywood Parkway at Western Ave., Calif. Div. of Highways, Los Angeles, bids to Dec. 9.

125 Tons, Perce Co., Idaho, bridge across Clearwater River at Lewiston, Director of Highways, Boise, bids to Nov. 19.

120 Tons, Cook Co., Ill., Caldwell Ave. bridge, Thomas McQueen Construction Co. low bidder.

• • • Railroad car awards and inquiries this week included the following:

The Rock Island R.R. has ordered 100 hopper cars from the Pullman Standard Car Mfg. Co. The Pennsylvania R.R. will build 2000 heavy duty gondolas in their own shops at Altoona, Pa.

50 YEARS AGO

THE IRON AGE, November 16, 1898

• "An interesting subject for contemplation is the fact that never before have natural laws had such free play as now in the commercial world. Despite the inertia or ignorance and conservatism, the superficial interference of ignorant legislators and the short-sightedness and impractical schemes of enthusiastic reformers, commerce is being gradually freed from those shackles which have limited its scope."

• "Hugh S. Taylor of Homestead has invented and patented a process for manufacturing steel that is claimed to be rust proof. The Homestead Mfg. Co. plans to build a new plant with production entirely devoted to this new steel."

• "The London Economist admits, 'It may be that in the future we may have to take second instead of first place in the iron and steel trade of the world. What has proven true in manufacturing lines may become equally true in the mercantile world, and there are indications in England that this is being realized.'"

• "The annual report of the Commissioner General of Immigration for the fiscal year ended June 30, 1898, shows that 218,562 immigrants entered the country last year. Of these, 44,473 were illiterates over 14 years old, and 96,203 brought with them less than \$30.00."

• "A series of experiments made with alloys of iron and nickel in Berlin indicate alloys with 30 pct nickel cannot be forged. The presence of nickel increases the resistance to stress, up to 16 pct, and elasticity declines. Beyond 16 pct tensile and crushing strength declines, while elasticity again increases."

• "Hunting new uses for steel is a search that is being steadily prosecuted now that prices are low enough to substitute its use for almost any material which it can replace. Its use in mines in place of timber has been inaugurated by some enterprising engineers, but a more significant undertaking is at Cripple Creek, Colo., where a big mine shaft is to be cased with steel."

Weekly Gallup Polls . . .

Analysis Reveals Some Factors Causing Poll Errors

Princeton, N. J.

• • • The crow having been consumed in quantities by all poll-takers, the question that they are now asking themselves and the question that readers are asking is, "What next?", according to George Gallup, director, American Institute of Public Opinion.

The election demonstrates two salient facts regarding polls. The first is that procedures and methods employed in election forecasts must be greatly sharpened and improved, particularly if they attempt in the future to pick the winning candidate in close elections. Researchers have had to lick tougher problems than this.

Several lines of investigation are now being carried on by the institute which will sooner or later uncover the faults in the methods used in the last election and will provide safeguards for future elections.

Not only is the institute looking into its procedures, but it has requested that a group of leading social scientists of the country examine the methods used in the recent election.

THIS group is headed by E. Pendleton Herring, formerly of Harvard University and now President of the Social Science Research Council. All the leading polling organizations have asked the same group likewise to check their findings.

One fact has already emerged, which seems to be of paramount importance. That is the factor of time. Enough evidence has already come to light in the institute's own analysis to indicate that polling operations in future elections must be set up in such a way as to cover last minute shifts in opinion. They cannot, as they do now, stop polling the week before the election.

But the second and by far the most important factor is that the election figures, even regarded in the most searching and critical light, demonstrate that opinion

can be measured with a fairly small margin of error. A look at the election forecast of the Gallup Poll and the election results indicates this.

	Gallup Figures Pct	Latest Elec. Res. Pct	Points Devia- tion Pct
Dewey	49.5	45.5	4.0
Truman	44.5	50.0	5.5
Wallace	4.0	2.4	1.6
Thurmond	2.0	2.1	.1

The largest deviation, it will be noted, was on the Truman vote. It represents a deviation of 5½ percentage points. The average deviation on all four parties is three percentage points.

In the release four days before the election, it was indicated in the period of 13 years since the Gallup Poll was founded, the average error in a total of 197 election forecasts was 3.9 percentage points.

IN the case of Mr. Truman's vote, the error was 1.6 percentage points over this record which has been established since 1935. On the other hand, the average deviation for the other three parties came within the 3.9 percentage point figure which had been the actual average error in all elections previously covered.

Even more important to the American public is the fact that

Procedures and Methods Are
Being Sharpened to Uncover
Faults and Insure Validity

o o o

no other method has yet been devised which will perform the task with the same degree of accuracy. No one has yet found, either here or elsewhere in the world, a better way to ascertain public opinion than by the sampling process.

To be specific, no one has found a better way to measure knowledge about or attitudes toward such problems as the Marshall Plan, the draft, prohibition, taxes, and other major issues of the day.

DURING the coming months, Congress, and the American people, will have many new issues to meet. Many will wish to know the views of the people on these issues—1. What is the opinion of the people on public housing? 2. What about taxes? 3. What are the views of the people regarding price control? 4. What is the attitude of the American people on the question of civil rights? 5. What do people think about the Marshall Plan? What do they know about it? Do they think it should continue? 6. What about federal aid to education? 7. What about the minimum wage? 8. What do various groups in the population think about proposals which will be made about labor legislation?

These problems are all vital to the American people. Until someone devises a better way of finding out what people know about these issues and what they think about them, the Gallup Poll will continue to function and to perform what it regards as a real service to the American people and to the democratic process.

Polls Discontinued

New York

... As stated last week we had delayed decision on continued publication of Gallup surveys until a detailed report was received on possible changes in technique to avoid repetition of an error such as occurred in the election predictions.

The report has been received from Dr. George Gallup and in some respects it sets up new and improved survey techniques.

None the less, these surveys treat of so many controversial subjects and are now subject to so much question that the Editors of THE IRON AGE have decided to abandon their publication as of this week.

Truckers Emphasize Speedy Steel Shipments



ABOVE

• Hot-rolled strip in 5-ton coils on a trailer en route from Carnegie-Illinois' Irvin Works near Pittsburgh to Follansbee Steel Corp. Although trucking this shipment to Follansbee, W. Va., saved less than \$1 a ton, the steel got to its destination the same day. It also bypassed the shortage of railroad gondolas.



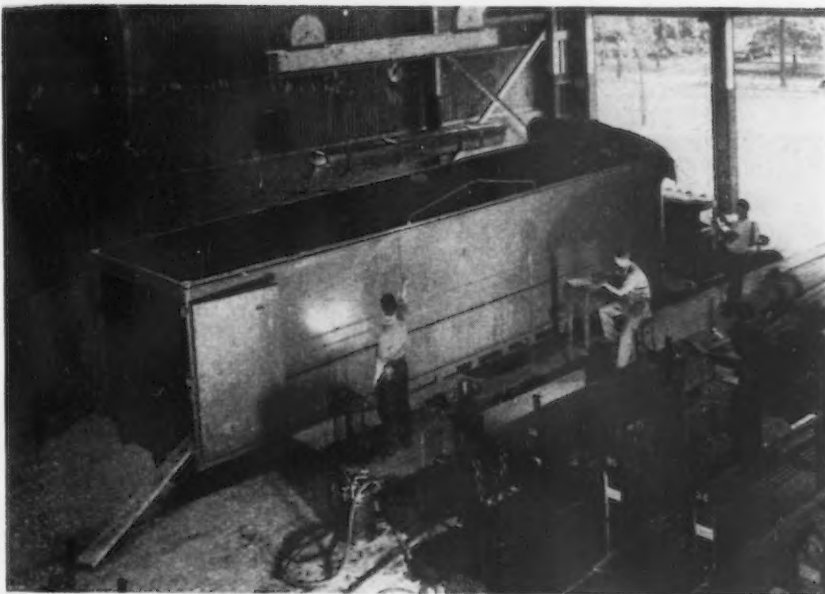
ABOVE

• This double trailer leaving the Irvin Works is carrying about 20 tons of sheets which it delivered in Detroit the next day. The trucker doesn't stress the \$24 saving in cost on the shipment but emphasizes speed—overnight delivery—to sheet-starved consumers. This contrasts with 3 days by rail. In Ohio and Michigan the payload limit is 25 tons; in Pennsylvania 20 tons, on double trailers.

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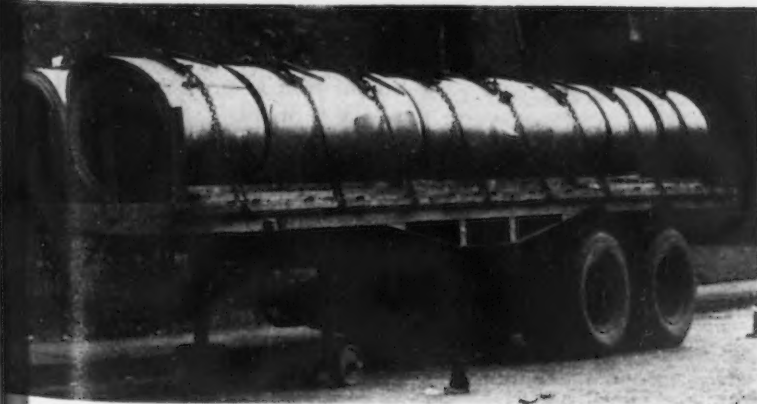
BELOW

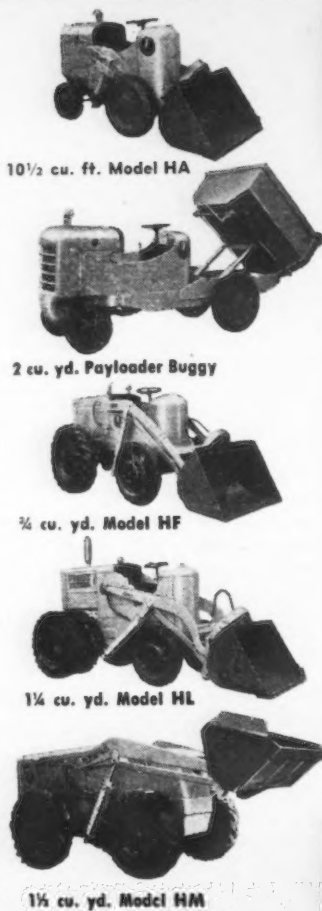
• Some truckers try for too much profit and run into trouble with police weighing crews. Police said that this trailer, stopped near Pittsburgh, was carrying 48 tons of coiled strip, a 33-ton overload. Railroads are in the van in the fight against overloading and Pennsylvania state police are cracking down on violators.



ABOVE

• Most steel is hauled in open trailers but some is moved in covered vans. Steel mills don't like to load this type vehicle—may one day charge extra for it. Here cold-finished bars are being loaded at Jones & Laughlin's Pittsburgh mill warehouse. The setup permits loading eight trucks at one time.





HOUGH SAY HUFF PAYLOADERS PATENT 2,432,323

give production a **LIFT**

A versatile Hough Payloader will take over material handling jobs usually requiring crews of men and perform them faster, cheaper, better. These versatile labor-and-time-saving Tractor Shovels on pneumatic tires have solved diversified problems in thousands of plants . . . digging, loading, unloading, carrying and dumping bulk materials, removing snow and paying off in many other ways. They speedily pivot and turn in and out of box cars, through narrow aisles and doorways, travel up and down ramps and on paved or unpaved areas.

All Payloaders have the famous Hough Automatic Tip-Back bucket motion that gets full bucket loads readily and carries them low without spillage. Also hydraulic bucket control that dumps and closes the bucket so that loads can be dumped slowly or quickly as desired. Investigate Payloaders! Find out how they can give production a lift and solve costly and laborious material handling jobs in your plant! Complete literature is yours for the asking.

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TRACTOR SHOVELS



LIBERTYVILLE, ILL.
SINCE 1920

NEWS OF INDUSTRY

Railroad Outlines Its Diesel Engine Program

Flat Rock, Mich.

• • • The old-fashioned railroad roundhouse is now square.

This week members of the Detroit press section had the privilege of inspecting probably the cleanest railroad repair shop in America. The new shop was recently completed by the Detroit-Toledo & Iron-ton R.R. at Flat Rock, 17 miles west of Detroit. Estimated cost is \$500,000.

Visitors were shown the new building designed by D-T & I engineers to service the company's nine diesel yard locomotives. Plans have been made to extend the building to accommodate additional diesel units to be purchased in the future. At present the D-T & I is operating 48 steam units in addition to its new GM diesels.

D-T & I executives expect the new diesels to pay for themselves in reduced operating cost and improved availability within the next 5 years. Initial cost of the new units was \$89,000 each, but the price has recently been boosted to \$103,000.

D-T & I officials pointed out that the diesel is particularly adaptable for yard use. The greatest economies are realized, it was emphasized, when this new type motive power is used for yard work.

It is expected that diesel freight locomotives may be added at some future date.

Operating costs of the yard service diesels are estimated as about 80¢ per hr compared with an average operating cost of \$2 per hr for steam switching locomotives.

The 125 Detroiters who made the trip recalled that D-T & I was once owned by Henry Ford. The Ford Motor Co. is still its largest customer.

Executives of the railroad pointed out that at present about 27 pct of the railroads' traffic is coal. The line hauls considerable tonnage of steel, but it has been observed that this volume has been falling off as an increased number of steel users have come to rely on trucks and water shipment.

Also on display were a series of new box cars and rebuilt gondola cars equipped with "Nailable Steel Flooring" produced by Great Lakes Steel Corp. The D-T & I railroad

A RAZOR

A LOCOMOTIVE



AND FAST TABLE TRAVEL

125 f. p. m. longitudinal table speed means fast micro-accuracy* production with GRAND RAPIDS GRINDERS



Fast longitudinal table travel—The fastest available in any grinder—is an important reason why you find Grand Rapids Grinders in so many leading plants. Such rapid operation makes possible high-speed, accurate production . . . of small mass-produced razor parts, as well as massive locomotive sub-assemblies.

You get many other assurances of long-life speed and accuracy in Grand Rapids Grinders, such as: vibrationless rigidity achieved by massive one-piece column and base casting; patented vertical head adjustment; flanged-type, pre-loaded ball bearing spindle.

* Accuracy within 0.00025 limits

To serve you—Your inquiry concerning your specific grinding needs will receive prompt attention. Grand Rapids Grinders include: Hydraulic Feed Surface Grinders, Universal Cutter Grinders, Hand Feed Surface Grinders, and Combination Tap and Drill Grinders.



200 STRAIGHT AVE., S.W., GRAND RAPIDS 4, MICHIGAN

GRAND RAPIDS GRINDERS

was one of the pioneers of this development.

According to company representatives, Great Lakes' Nailable Steel Flooring has now been under development for about 7 years. At present, more than 600 freight cars are equipped with this unique construction which consists of steel channels 8 in. wide laid crosswise in the car. There is a nailing groove between each channel. Ordinary soft nails driven into the grooves are deformed by the bending action of the channel flanges. This holds them firmly in place. The nailing grooves are filled with plastic material.

The flooring is made of Great Lakes' high tensile NAX steel. Depending on the size of the car, it is reported that the cost of the Nailable Steel Flooring is three to four times that of ordinary wood or steel.

In addition to its greater strength the Nailable Steel Floor converts a gondola, for example, into an all-purpose car. All kinds of freight can be nailed securely in place yet the cars are able to haul rough, heavy freight that chews up the wood floors of most freight cars. In the Detroit area a number of gondola cars are currently being used to supply equipment to auto plants; the same car is then used to haul scrap to Detroit steel mills.

Batt Urges the Use Of More Training Programs

Philadelphia

•••Broader and more effective use of industrial training programs as a means of gaining greater acceptance for the principles of a free economy was recommended by William L. Batt, president of SKF Industries, Inc., before the second annual session of the Pennsylvania Society of Training Directors here recently.

"Industry must take the lead in convincing its workers and the public at large that a system which has constantly produced more goods for more people at lower prices is the best system, and that under no other system do employees enjoy as many opportunities for advancement or receive as considerate treatment," Mr. Batt declared.

---on cutting fuel bills in Half



During New England's severe winter of 1947-8, the J. C. Corrigan Company, Inc., of Dorchester, Mass., cut its fuel bill nearly 50% by installing a DRAVO Counterflo Heater. Coal for the previous winter season had cost this company between \$1100.00 and \$1200.00, whereas only \$652.00 was spent for oil to fuel the DRAVO Heater during a similar period.

Besides fuel savings, the maintenance expense for the old heating system was practically eliminated because the DRAVO Heater operates automatically by thermostatic control. "Even more important" says J. C. Corrigan, President, "... part of our substantial increase in production this winter was due to the improved heating system."

Employees in the Corrigan plant manufacture custom-built conveying systems and need adequate warmth for efficient fitting and assembling. Previously, the plant was heated by a coal burning furnace using blowers and ductwork to distribute the warm air. Excessive roof heat losses in this 165' x 70' x 27' building prevented it from being comfortable. To heat "cold spots" that developed, eight pot-bellied stoves were installed. Maintenance of this old heating method required three hours labor every day. Coal and ashes had to be hauled through the heart of the busy plant. Even with the eight stoves to supplement the coal-fired furnace, heat was

inadequate and employees spent valuable production time huddling around the stoves.

In November 1947, one DRAVO Counterflo Heater with an output capacity of 2,000,000 Btu was installed. No ductwork was needed. Only fuel and power lines had to be connected and a vent stack installed. Now the entire factory area is maintained at the proper degree of warmth for workers' comfort and efficient production.

During sub-zero weather last winter, the single DRAVO Heater delivered enough heat within 20 minutes after it was turned on to satisfy the thermostat's setting. Moreover, the DRAVO Heater is shut down to conserve fuel during non-working hours, whereas the coal furnace had to be fed over week-ends while the plant was not in operation to maintain some warmth for the Monday morning shift.

DRAVO Counterflo Heaters burn oil, gas or coal. Units burning non-solid fuels can be converted from one fuel to another very readily. Coal-fired heaters can be converted for burning gas or oil.

DRAVO CORPORATION, Heating Section, Dravo Bldg., Fifth and Liberty Avenues, Pittsburgh 22, Pa.

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Heating
with
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We would like to consider DRAVO Counterflo Heaters for:

Name..... ☐ Comfort Heating
Title..... ☐ Year 'round Ventilating
Company..... ☐ Process Drying
Address..... ☐ Tempering Make-up Air
City and State..... ☐ Heat Curing
P-6374

Industrial Materials Account for 41 Pct Of Authorizations by ECA

Washington

••• As of Nov. 1, a summary shows that the Economic Cooperation Administration had approved purchase orders totaling \$983 million worth of industrial goods such as machinery, metals and ores, steel mill products, and so on.

Industrial materials accounted for nearly 41 pct of the total \$2,137 million worth of Marshall Plan help which the ECA authorized during its first 7 months.

In line with its announced intention of concentrating upon industrial aid, the ECA last week announced new purchase authorizations for an additional \$5 million worth of industrial materials for first quarter 1949 delivery and more than \$6 million for the second quarter.

At the same time, additional authorizations for \$5.7 million worth of industrial orders were announced for delivery during the last quarter 1948. Another \$3.5 million worth was authorized for purchase by the Netherlands, no delivery date specified.

The proposed Dutch purchases include \$2.1 million worth of machine tools. These include drilling and grinding machines, lathes, and other varied items including special types of textile and shoe machinery.

Specific types of goods included in 1949 first quarter deliveries include \$4 million worth of construction and mining machinery, largely to Bizone, Germany; \$9.5 million in iron and steel mill materials, mill products and ferro alloys, mostly to the United Kingdom; and, about \$1.7 million worth of miscellaneous industrial material including office type machines.

Approvals for next year's purchases were stepped up following quick action by the Marshall Plan countries after ECA had announced that authorizations would be halted until loan agreements were signed. A flood of signatures followed.

Among them were: \$35 million with Norway, \$170 million with France, \$80 million with Holland, \$50 million with Italy, all of which is to be used primarily for the

(CONTINUED ON PAGE 166)



going in for
MOTORIZED HANDLING?

IS YOUR FIRM getting its first taste of battery-powered handling by using one or more motorized hand trucks? Chances are that you're trying out your equipment on all sorts of jobs . . . and realizing in how many ways battery-industrial trucks can speed handling and increase production.

If so, now is the time to become acquainted with long-life EDISON Nickel-Iron-Alkaline Storage Batteries . . . the batteries that give you real dollar economy. Did you know they're electrically foolproof—require no critical adjustment of charge rates—can't be injured by reverse charging, short circuiting or similar electrical accidents? Did you know they're built of rugged steel inside and out to withstand rough usage? Did you know EDISON Service Engineers check your batteries regularly and help you to maintain them in top condition?

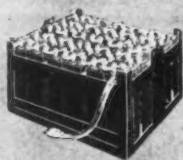
EDISON Batteries last and last, and so through the years their superiority costs you less and less. Prove this to yourself by asking the EDISON users in your own vicinity, then profit by their experience.

ADVANTAGES OF EDISON NICKEL-IRON-ALKALINE BATTERIES:
They're mechanically durable; electrically foolproof; quickly and easily charged; simple to maintain; not injured by standing idle.



EDISON

Nickel • Iron • Alkaline
STORAGE BATTERIES



EDISON STORAGE BATTERY DIVISION

of Thomas A. Edison, Incorporated, West Orange, N. J.

In Canada: International Equipment Co., Ltd., Montreal and Toronto

BOTH BUILD PROFITS!

MATERIAL HANDLING *News*

The truly vital element in any fabricated product is the idea back of it.

When Clark undertook some 30 years ago to build Materials Handling equipment, it was with the idea that it could evolve new and better handling methods and that it could produce for their implementation machines that would excel all others. That these objectives have long since been achieved and that they are maintained is demonstrated by Clark's leadership in the Materials Handling field. Furthermore, *users* endorse these products with enthusiasm and are quick to point out that they embody all the qualities that Industry has come to expect from Clark's unique experience, competence, skill and idealism.

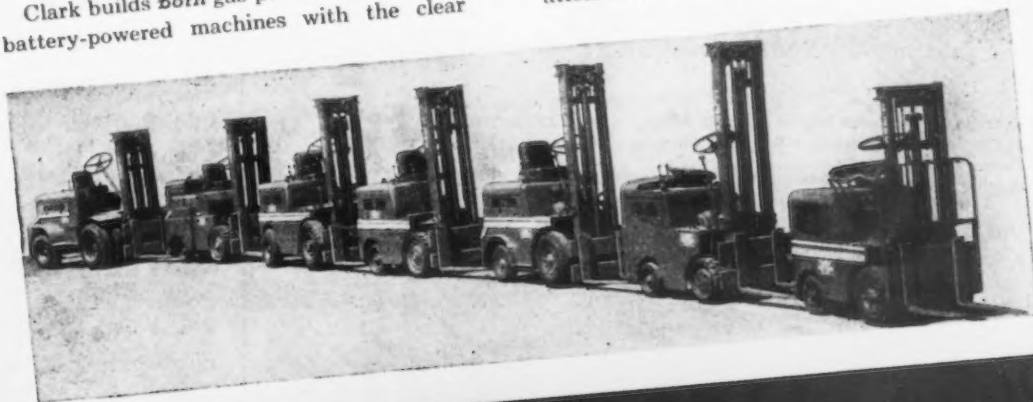
Clark builds *both* gas-powered and electric battery-powered machines with the clear

this **CLARK** team
sure has **EVERYTHING**
... A most complete line with
capacities from 1000 to
7000 lbs. ... **PLUS** unbiased
evaluation of individual needs.

intent that each shall be the best of its kind. Insofar as possible, parts of the two power types are interchangeable for the sake of production economies which are passed along to the user in the form of lower initial cost and negligible maintenance costs. And practically all parts are manufactured in Clark's *own* plants to Clark's *own* exacting standards of quality and master workmanship.

To an analysis of Materials Handling operations, Clark brings complete objectivity because it is the producer of both power types. Its sole aim is to determine which type will serve more efficiently and more economically under conditions involved.

For a complete line that has **EVERYTHING**, and for dispassionate and unbiased counsel concerning Materials Handling operations: **CONSULT CLARK.**



CLARK

EQUIPMENT COMPANY

BATTLE CREEK 51, MICHIGAN

OTHER PLANTS: BUCHANAN, JACKSON, BERRIEN SPRINGS, MICHIGAN, U.S.A.

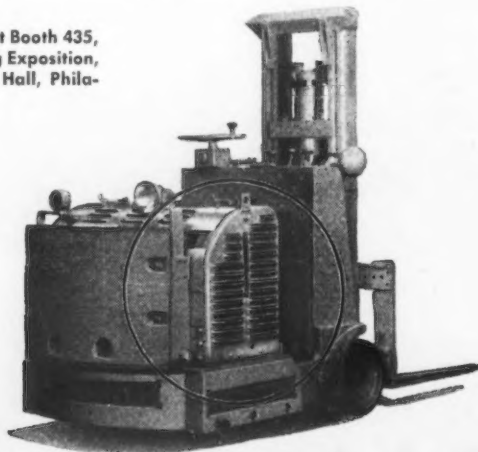
Let **READY-POWER** Solve Your Trucking Problems



Ready-Power-Equipped Baker Fork Trucks Loading Semi-Trailers

Heavy loads and long hours can't stump Ready-Power gas-electric Power Units. They are designed to "take it" and built to last. They're better than good enough to handle the toughest jobs hour after hour, day after day with constant power generated right on the truck. Specify Ready-Power for your next electric truck or write for information about converting present equipment.

Visit the Ready-Power Display at Booth 435,
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January 10 to 14, Convention Hall, Phila-
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Ready-Power-Equipped Lewis-Shepard Fork Truck

THE **READY-POWER** CO.

3822 Grand River Ave., Detroit 8, Michigan

NEWS OF INDUSTRY

(CONTINUED FROM PAGE 162)

purchase of agricultural and industrial machinery and equipment and raw materials.

Totals for selected industrial goods included in the 7-month ECA summary were (rounded figures):

Chemicals and related products, \$55.3 million; coal and fuel, \$154.4 million; nonferrous metals, \$131.6 million; metallic ores and concentrates, \$8 million; primary iron and steel mill products, \$51 million; advanced mill products, \$10 million; iron and steel finished manufactures, \$3.1 million; machinery, including agricultural, \$94 million; vehicles and related equipment, \$90 million; and, miscellaneous industrial commodities, \$13 million.

Roll Engineer Retires

Pittsburgh

• • • Jones & Laughlin Steel Corp. reports the retirement of Norman C. Rendleman, roll engineer. Dur-



N. C. Rendleman

ing his 44 years of service with the corporation, Mr. Rendleman has developed a number of designs for mills. He has also developed rolls for special shapes and products, some of which have been patented.

He served his apprenticeship at Inland Steel Co. and started at J&L as a lathe operator in the Pittsburgh South Side roll shop in 1904.

Must Interrupt Schedules

Portland

• • • The power shortage in the Pacific Northwest has reached so critical a stage that aluminum plants at Troutdale, Vancouver, Longview and Spokane have been put on "interrupted schedules" between 5 p.m. and 7 p.m. daily. This action was started on Nov. 2, and will deprive the aluminum plants of up to 84,000 of their normal 650,000 kw load between those hours. This is said to mean an estimated reduction of more than 23,000 lb in the daily production of pig aluminum by those plants.

Sees \$16 Billion Needed In Next 10 Years for New Electrical Power

Pittsburgh

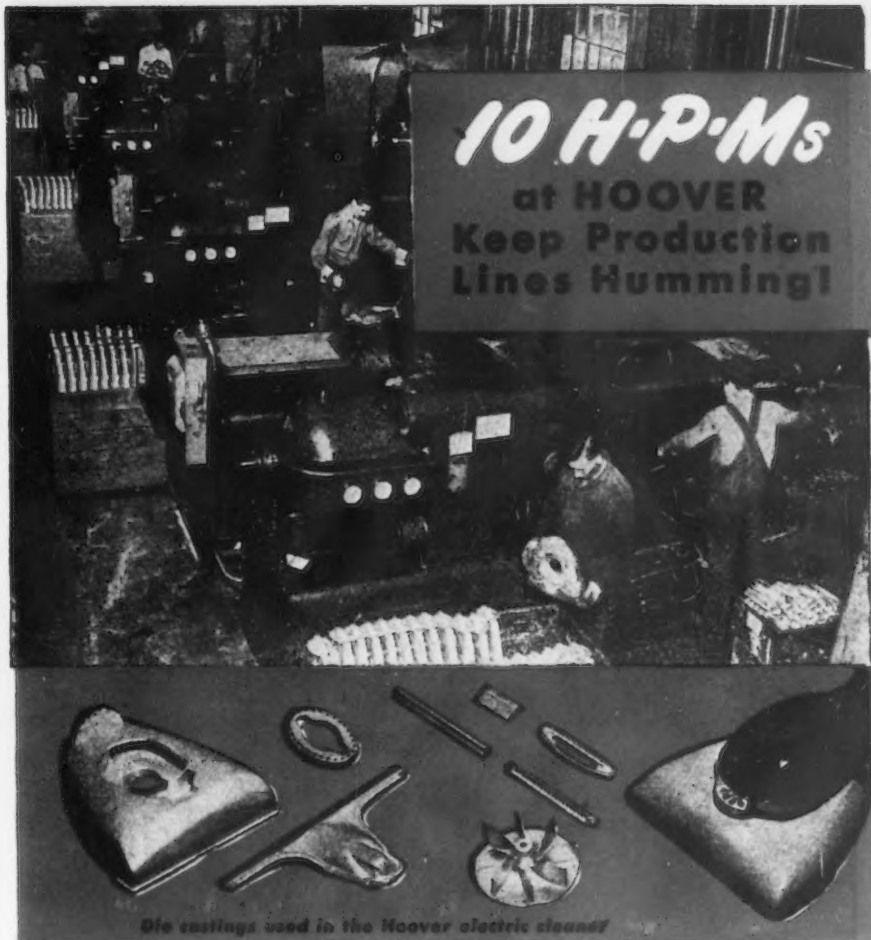
• • • Public utility companies in the United States will have to spend about \$16 billion for new and improved generating and distribution facilities, within the next 10 years, according to a prediction made by Tomlinson Fort, manager of central station sales for the Westinghouse Electric Corp., in a recent address before senior engineering students at Pennsylvania State College.

Production of electric power in this country must be increased from slightly over 250-billion kw hours to 430-billion kw hours to supply a demand that will nearly double within the next decade. An expansion of the generating capacity of this country from 52 kw to over 95-million kw will be required to produce this power. In money, said Mr. Fort, this means that the electric power business of the United States probably will have to double its investment over a period of the next 10 years.

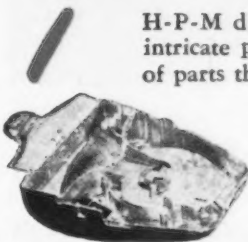
A recently completed Westinghouse survey of the outlook for the electric power industry indicates that residential use of electricity in this country will increase in the next 10 years from an average of 1438 kw-hr per home to 2400 kw-hr. Electricity now is available to 97 pct of the homes in this country.

More than 6 million new customers have been added to utility systems since the war ended and during the past summer 1200 new customers were connected for electric service each working hour of the day. More than 4 million farms now are connected to distribution lines and in the next 5 years this number will reach 5 million, or 90 pct of all occupied farms.

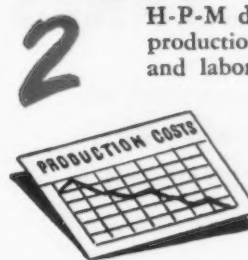
The availability of electric power also has contributed greatly toward higher wages and shorter hours for the American workman, he said. Largely due to electric power the mechanical horsepower in industry has shown a great increase during the past 70 years. In 1879, a workman had only 1.3 hp at his command. Today this average workman has over 7 hp available, Mr. Fort concluded.



Die castings used in the Hoover electric cleaner



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Canada Planning No Change in System Of Permits for Imports

Ottawa

••• There will be no change in the Canadian Government's allotment import permit system for 1949, C. D. Howe, Minister of Trade and Commerce announced. Mr. Howe pointed out that manufacturers of such things as motor cars, washing machines, and other consumer goods will be able to import American made parts, chiefly of steel and other metals, to the same value as in 1948.

However, he stated, they may earn an "export bonus" in 1949 if they can show an increase in their sales abroad during that year over and above their exports during the basic period—November 1946 to October, 1947.

The Minister also stated that provision is being made for holders of allotment permits to claim as an addition to their 1949 allotments any reasonable balance unspent during 1948. Any unclaimed export bonus earned up to and including Dec. 31, 1948, also may be included in the carryover to next year. Alternately, consideration will be given to charging excess imports during 1948 to the 1949 allotment permits.

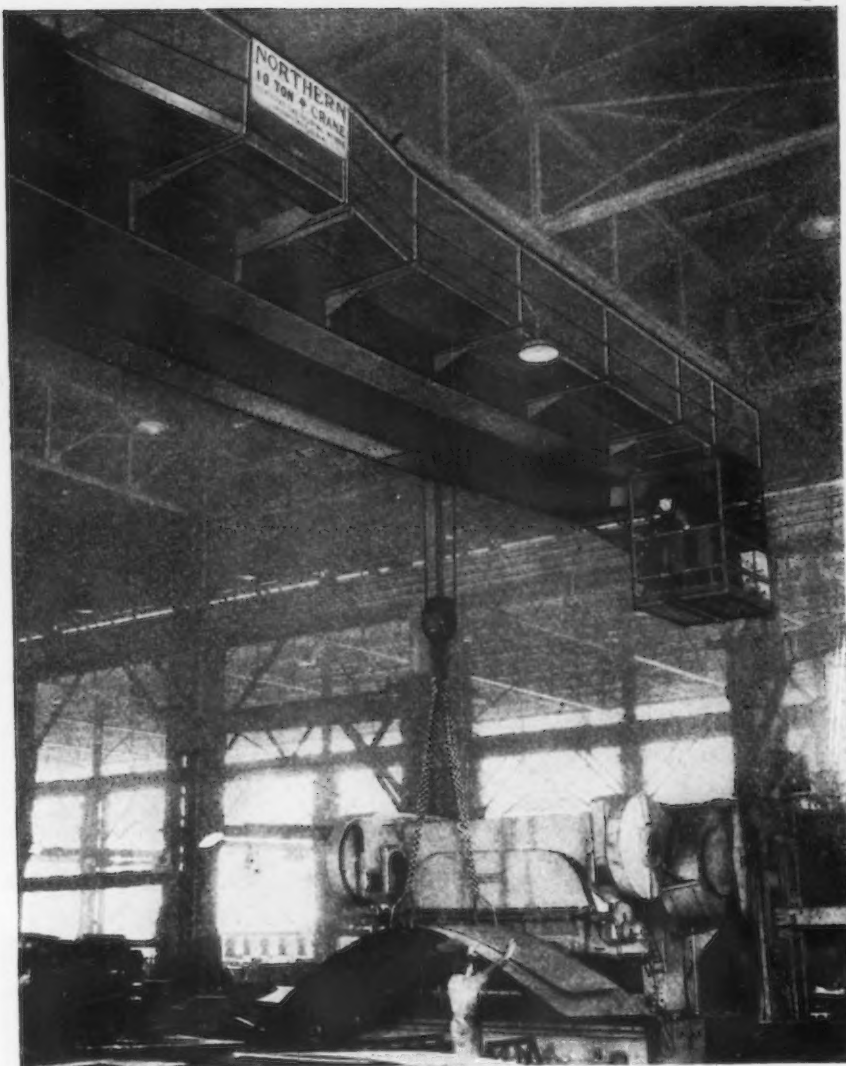
Arrangements are being completed by the Import Control Branch, whereby 1949 allotment permits will be issued during December. This will enable those entitled to a 1949 permit to obtain it without making further application before his present permit has expired. The new permits will be accompanied by a claim form for the unspent remainder of 1948 permits, for which claims may be made at any time during 1949.

Blaw-Knox Net Rises

Pittsburgh

••• Blaw-Knox Co. announced third quarter earnings of \$853,506, or 60¢ a share, and net profits for the first 9 months of 1948 of \$2,646,675, or \$1.88 a share. This compares with net profits of \$2,224,521, or \$1.65 a share, earned in the first 9 months of 1947.

Billings of products and services for the first 9 months of 1948 amounted to \$46,193,330, compared with \$39,303,760 in the corresponding 1947 period.



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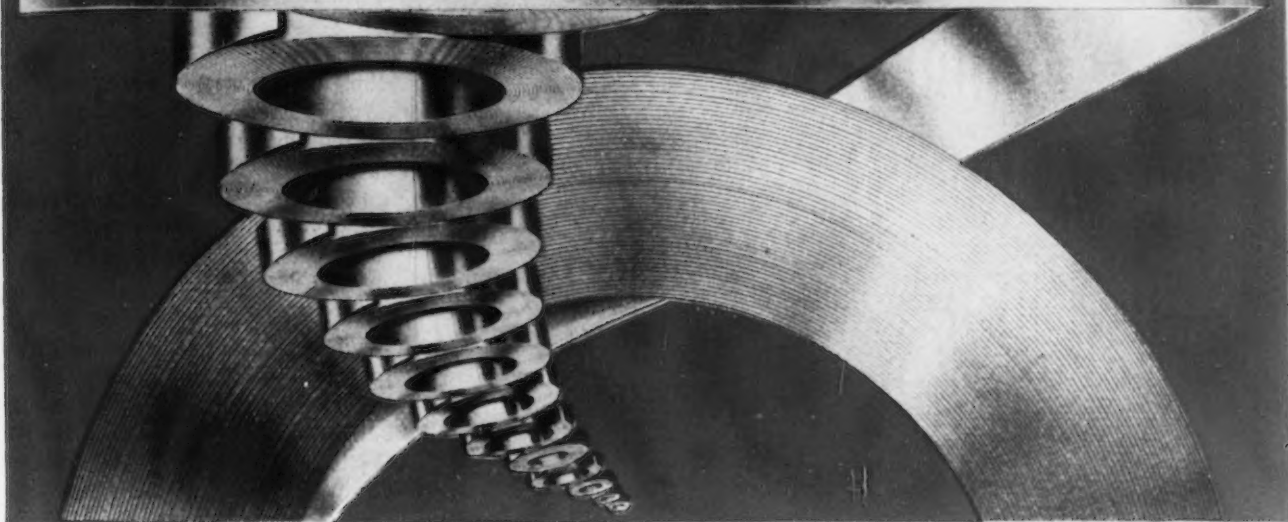
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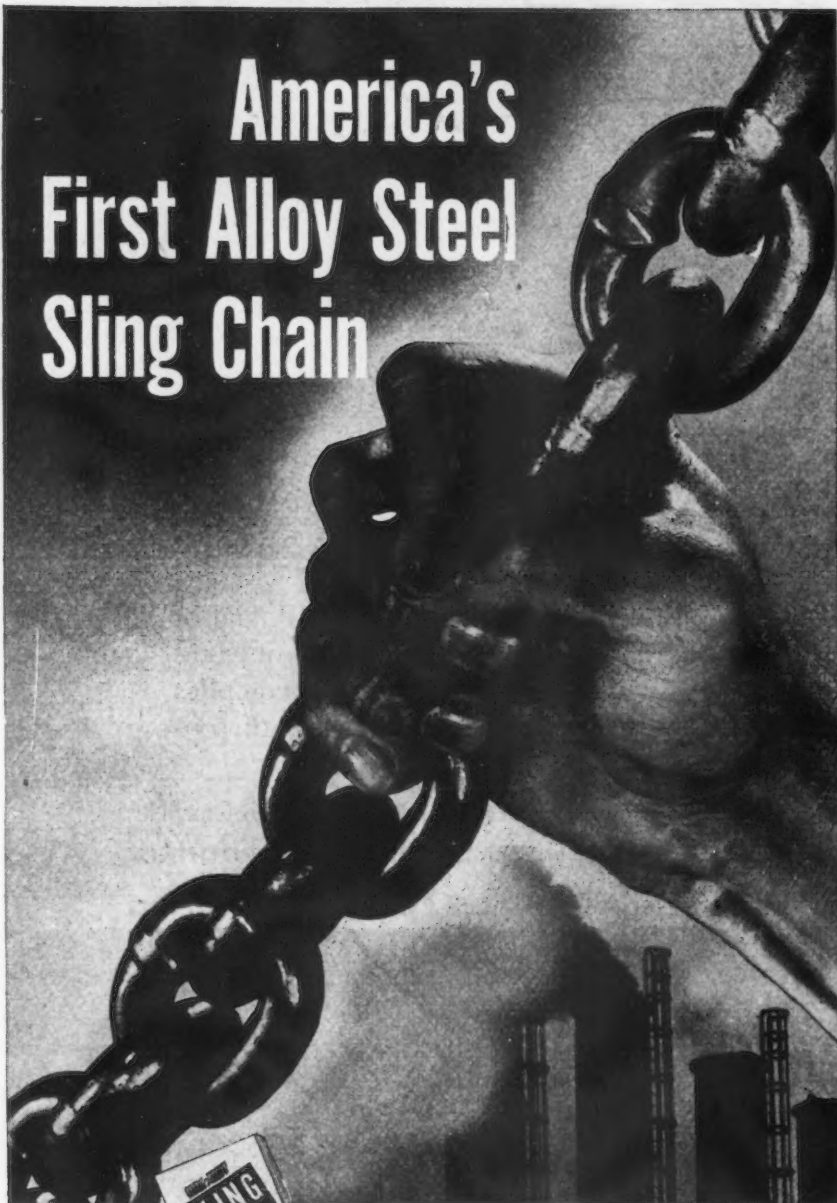
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NEWS OF INDUSTRY

50 British Firms Have Started Branch Plants In Canada Since War

Ottawa

... G. D. Mallory, director of the Industrial Development Div. of Dept. of Trade & Commerce, stated that about 50 British firms have set up branch plants in Canada since the end of the war. In all, some 450 British establishments now are operating branches in this country.

He said that before British firms obtain permission to move to Canada, they had to convince the British Treasury they would be able to obtain more United States dollars through the sale of Canadian made goods in the United States. They also had to show that security reasons made it advisable for them to have pilot plants away from their main plants in the United Kingdom. The firms had to undertake to pay dividends in Canadian dollars and they had to show that establishment of a Canadian branch would not interfere with the British export program.

Mr. Mallory said he did not know how long the movement of British capital here would continue. Money to establish Canadian plants now is being obtained through the sale of British-owned Canadian securities in the United Kingdom under terms of the 1942 loan. As funds become available through the gradual sale of these securities, the Bank of England allows the export of the corresponding amount of dollars to firms desiring to start businesses in this country.

This supply of capital may be cut off at any time, said Mr. Mallory. However, some insurance companies have indicated they are interested in supplying capital for firms coming to Canada. Most of the branch plants have been established in surplus war plants, but some firms are planning to build their own plants as soon as material and construction costs drop. The plants manufacture a wide variety of goods, ranging from motor cars to dog food and from biscuits to tungsten carbide.

Permanente Metals Shows Big Earnings' Increase

Oakland, Calif.

••• The Permanente Metals Corp., producer of 20 pct of the nation's primary aluminum, has risen to 12 month sales of \$69,605,000 and a current net earning rate of \$1 million a month, according to a report issued by Henry J. Kaiser, president.

"(1) Net earnings increased approximately 75 pct for the last fiscal year to a total of \$9,244,338. This was at a rate of \$3.55 a share, compared to \$2.05 for the preceding year, based on 2.6 million shares now outstanding. The increase reflected greater production and efficiency achieved from a longer operating period for new plants and the acquisition of new facilities.

(2) The report for the quarterly period ending Aug. 31 showed Permanente Metals continuing to strengthen its position.

(3) Permanente Metals, turning from war-time production of ships, magnesium, incendiary bomb material, chemicals and refractories, became one of the three producers of primary aluminum in the United States in 1946, at the same time continuing related chemical and refractory divisions.

(4) Approximately \$5,000,000 of the company's post war earnings were reinvested in new facilities and improvements, including: \$1,000,000 for improvements at the Tacoma plant, \$1,200,000 for a dock at Baton Rouge, \$1,200,000 for a soda ash plant, \$1,000,000 at the rolling mill, and research and testing facilities and explorations for sources of bauxite.

(5) Acquisitions of additional facilities and expansions into other products are under way, representing investments exceeding \$4,500,000 already provided for in the public financing.

Brake Shoe Sales Gain

New York

••• Sales of American Brake Shoe Co. amounted to \$87,298,341 during the 9 months ended Sept. 30. Sales in the first 9 months of 1947 were \$80,567,427. Sales during the quarter ending Sept. 30 were \$29,568,580, against \$25,525,764 in the 1947 quarter.

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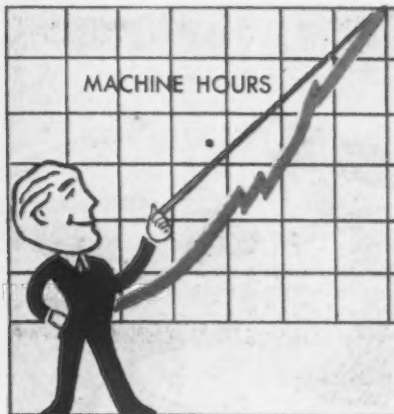
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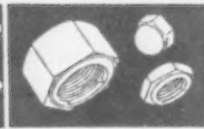
SHIMS



SHIM STOCK



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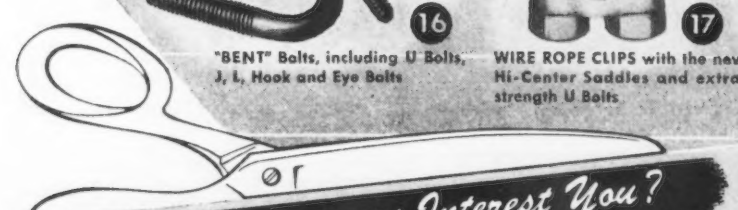
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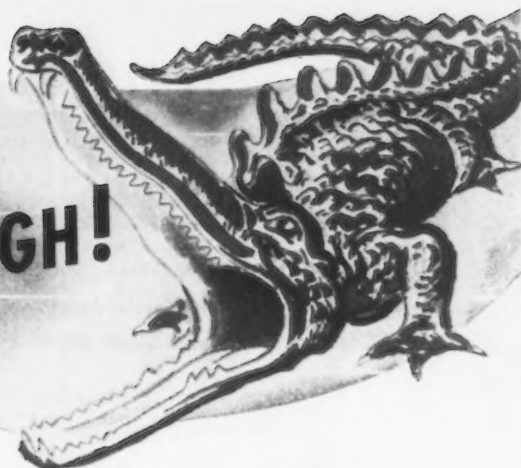
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a hard "hide"...
AND TOUGH CLEAN THROUGH!



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HERE'S THE *Big* DIFFERENCE

Ordinary Set Screws

HARD
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SOFT CORE
 MAY TWIST OFF
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YOU CAN'T JUDGE a set screw by its "skin" alone. You've got to get *below* the surface to determine real set screw quality.

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Box Score Indicates a Winner!

CUSTOMER: Appliance Division, The Cavalier Corp., Chattanooga, Tennessee.

PRODUCTS: Coca-Cola cooler-dispenser, Quaker Oil space heater.

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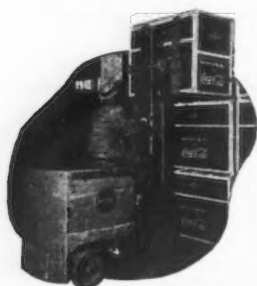


Baker 6000-lb. Fork Truck unloading skidded 6-ton packages of sheet steel from gondola cars with chain sling.

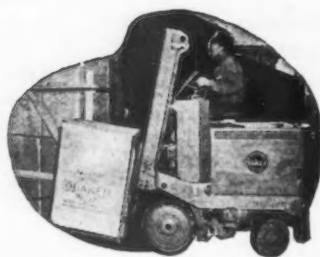


Same truck tying sheet steel packages in storage department.

OPERATION	TRUCKS USED	RESULTS
Unloading steel sheets in 3-ton skidded packages from gondola cars (50 tons per car). Transporting to storage and tying.	Baker 6000-lb. Fork Trucks	48 man hours cut to 4. Formerly took 6 men 8 hours for unloading alone. Now 2 men safely unload and store a carload in 2 hours.
Handling steel sheets from stores into production line.	Baker 6000-lb. Fork Trucks	More man hours saved. Aisles kept clear.
Handling and storing dies for stamping and blanking departments.	Baker 6000-lb. Fork Trucks	Time and storage space saved.
Moving finished products in cases to storage.	Baker 2000-lb. Fork Trucks	Operations speeded 50%. Warehouse capacity increased 50%.
Moving finished products from storage into boxcars.	Baker 2000-lb. Fork Trucks	16 man hours cut to 1. Formerly took 4 men 4 hours to load a car. Now 1 man does it in about 1 hour.



Baker 2000-lb. Fork Truck tying cases of finished product in warehouse.



Baker 2000-lb. Fork Truck loading cases into boxcars.

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Baker INDUSTRIAL TRUCKS

NEWS OF INDUSTRY

Canadian Imports Of Structural Steel Now Need Import Permits

Toronto

... All Canadian importations of certain types of structural iron and steel from the United States now require import permits, under provision of the Export and Import Permits Act, according to announcement by C. D. Howe, Minister of Trade and Commerce.

The Trade Minister stated that this action has been taken by the Canadian government in connection with the agreement reached with the United States government to limit imports of iron and steel to a maximum of 200,000 tons for the last quarter this year. The new import regulation applies to types of structural iron and steel classified for entry into Canada under tariff items 388, 388a, 388b, 388c, 388d, and include various iron and steel angles, beams, channels, columns, girders, joints, tees, zees, used chiefly in the construction of large buildings and in manufacturing.

Arrangements are being made to issue import permits which provide for the importation, during the balance of this year of specific tonnages of steel where a manufacturer or importer had a standard pattern of importations, while specific or spot importations will be the subject of individual permits.

Mr. Howe stated imports issued, or which may be issued, under the Emergency Exchange Conservation Act, will be honored in connection with the importation of the items covered by the new regulation. All structural steel or iron covered by the regulation which was in continuous transit to Canada on or before Oct. 24, as well as steel from countries other than the United States, will not require an import permit.

Application for new permits will be handled by the Import Permit Branch of the Department of Trade and Commerce. Those importers who require specific or spot supplies of structural steel will be able to obtain the necessary forms from their local customs office.

The most serious effect of the reduced importations of iron and steel for last quarter this year

from the United States will be on the structural steel and steel pipe industries of Canada, but practically all steel working industries will be affected to some extent. The major portion of the structural steel used in Canada, and all the heavier shapes, are imported from the United States, while practically all the raw materials used in the manufacture of steel pipe come from across the line. With structural steel cut to 35,000 tons or 34 pct below the last quarter of 1947, and imports of skelp cut 11 pct, it is readily seen what effect these reductions will have on the industries referred to above.

Tool & Die Men Plan Special Events At Their Annual Meet

Cleveland

... National Tool & Die Manufacturers Assn. will hold its annual meeting Nov. 14-17, at Hotel Schroeder, Milwaukee.

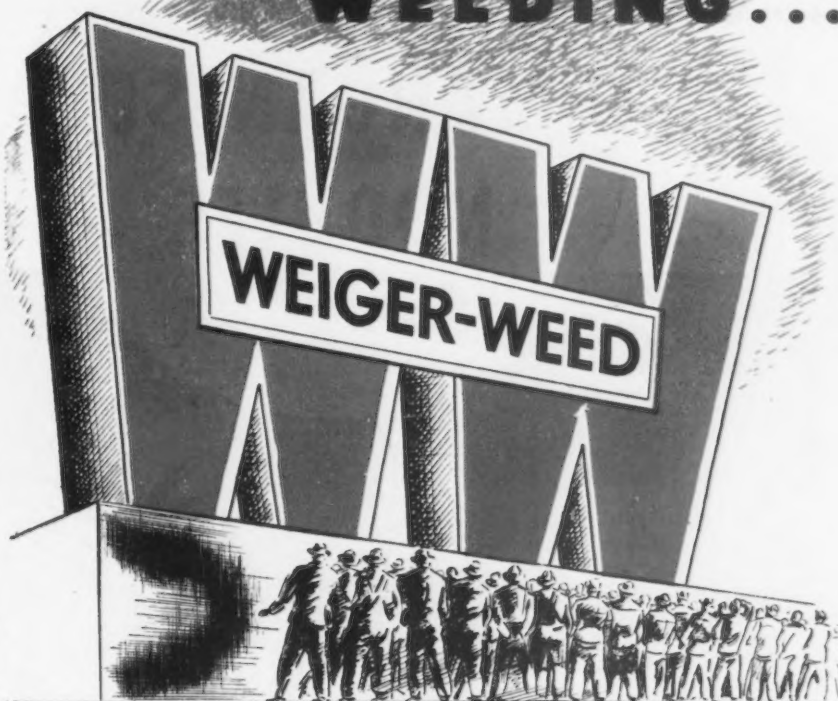
A. G. Bryant, past president, National Machine Tool Builders' Assn., will be the speaker at the Nov. 15 luncheon. Mr. Bryant is president, Bryant Machinery & Engineering Co., Chicago, and vice-president, Cleereman Machine Tool Co., Green Bay, Wis.

Walter C. Ploeser, member of Congress, 12th District, Missouri, and chairman of the House Small Business Committee, will address the luncheon session on Tuesday, Nov. 16.

Pay Incentives for tool and die shop employees will be the subject of a thorough discussion at the Tuesday afternoon business session. Robert C. Trundle, operating vice president, Trundle Engineering Co., Cleveland, will present recommendations on incentive plans, based on studies made in a typical shop, and members of the association will tell of their experiences with incentive plans, both successful and unsuccessful.

W. R. White, Jr., president, NTDMA and vice-president, Midwestern Tool Co., Chicago, will preside. L. A. Wacker, vice-president, Sterling Tool & Mfg. Co., Milwaukee, is chairman of the convention committee.

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Since early 1946, users of resistance welding have come to recognize Weiger-Weed as the progressive company, the company that grows with the industry, that keeps to the front with time-saving and cost-saving developments.

The personnel of Weiger-Weed, both at the plant and in the field, is made up of men who pioneered in the development, application and manufacture of copper base alloys for resistance welding. The knowledge and experience of these men is backed by the resources, facilities and metallurgical experience of the Fansteel research staff, all working together to serve you.

Weiger-Weed places at your service its special engineering and production skills to help your production engineers to obtain more and better welds at lower cost. Write for recommendations on your problems. Weiger-Weed & Company, Division of Fansteel Metallurgical Corporation, 11644 Cloverdale Ave., Detroit 4, Mich.

Weiger-Weed produces high quality spot welding tips, holders, seam welding wheels, and special dies for flash, butt and projection welding. Deliveries are prompt; standard electrodes and holders supplied from stock.



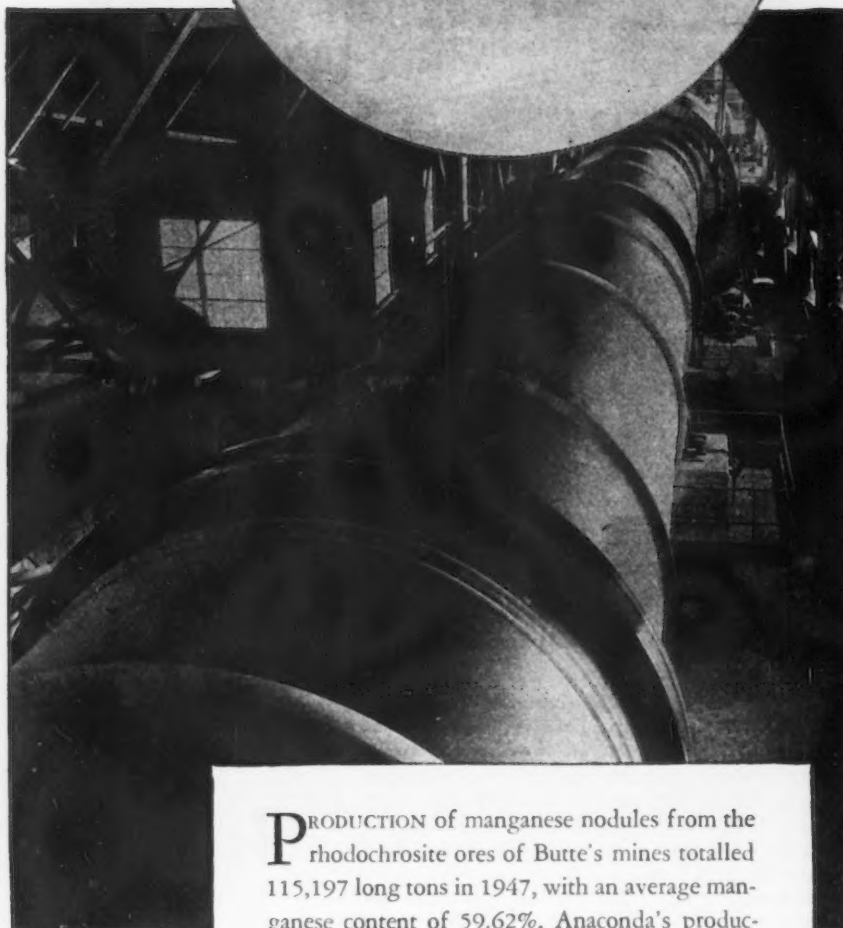
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DIES • TIPS • WHEELS • HOLDERS
DIVISION OF FANSTEEL METALLURGICAL CORPORATION

Anaconda

MANGANESE NODULES



PRODUCTION of manganese nodules from the rhodochrosite ores of Butte's mines totalled 115,197 long tons in 1947, with an average manganese content of 59.62%. Anaconda's production is the principal U.S. source of supply for producers of ferro-manganese and other consumers of metallurgical grade ore.

Illustrated above is the 270-foot kiln at the Anaconda Reduction Works in which the manganese concentrates are sintered at a temperature of 2600° F. *



48356

ANACONDA COPPER MINING COMPANY

Offices: 25 Broadway, New York 4, N. Y.

Anaconda, Montana

NEWS OF INDUSTRY

Advocates 6-Point Plan Of Apprentice Training

Cincinnati

••• A six-point plan for nationwide expansion of apprentice training to build up the skilled manpower in production plants called for by the national defense program was proposed at the American Federation of Labor Convention, by William F. Patterson, director, Bureau of Apprenticeship, U. S. Dept. of Labor.

Mr. Patterson's recommendations were made in an address before representatives of the Metal Trades Dept. of the AFL meeting in Cincinnati.

Among his recommendations were the formation of national joint labor-management apprenticeship committees in each of the various metal trades; an increase in local joint committees to set up and direct apprenticeship programs in all plants and shops; appointment of full-time directors of apprentice training for area-wide programs; and increased activity in apprenticeship on the part of national employer associations as well as among the labor unions.

Steel Mills Set Records

Pittsburgh

••• Production of steel ingots reached a new all-time high last month in U. S. Steel's Pittsburgh district mills of Carnegie-Illinois Steel Corp. and National Tube Co.

Carnegie-Illinois plants in the Pittsburgh-Youngstown area produced 974,561 net tons. The previous high was 972,696 tons in October 1947. In addition, the company's shipments of steel products reached a new peacetime peak last month.

National Tube mills at McKeesport, Pa., and Lorain, O., chalked up 270,193 net tons of ingots, almost 10,000 more than the former record of 260,563 tons in September 1944. The tube company also set an all-time blooming mill record of 224,821 tons, compared with 220,065 tons in October 1941.

In addition to these company-wide records, 28 all-time plant records were made in mills of these U. S. Steel subsidiaries at McKeesport, Duquesne, Homestead, Dravosburg, Johnstown, Youngstown, and Lorain.



Machinability Starts Here

• A heat of Wisconsin steel pours into the ladle where it is Sulfite-Treated. That means it will be far more machinable than ordinary steel. *And*—physical properties remain completely satisfactory.

Solve your machining problems with Wisconsin's magic metal—Sulfite-Treated Steel. Check your requirements with our sales and metallurgical departments.

WISCONSIN STEEL COMPANY

(Affiliate of International Harvester Company)

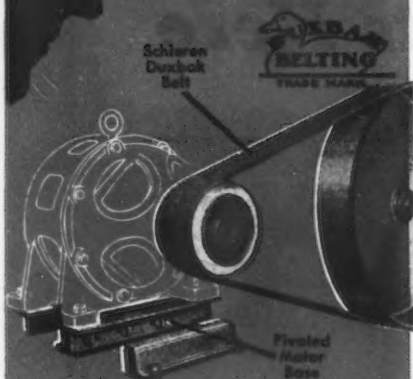
180 North Michigan Avenue

Chicago 1, Illinois

WISCONSIN SULFITE-TREATED STEEL

THE IRON AGE, November 18, 1948—177

Have you looked into this New, Low-Maintenance Drive?



This new drive saves you maintenance dollars because it protects itself against belt and bearing abuse. Furthermore, it has the capacity, at all times, to transmit the total output of the motor.

Here's how it works.

THE PIVOTED BASE GIVES YOU AUTOMATIC TENSION CONTROL

With the pivoted motor base you can predetermine how much belt tension you'll need to handle peak loads. You set the base; letting a part of the motor weight lean into the belt to give you the proper tension. From then on, the drive automatically maintains that tension despite all variations in load. This eliminates guesswork and keeps belt and bearing wear to a minimum.

THE SCHIEREN DUXBAK BELT PROVIDES SHOCK ABSORBING ABILITY, FULL-FRICTION PULLEY GRIP, LONG LIFE

The Schieren Duxbak belt does its part in this new, low-maintenance drive team by soaking up shock. This high quality belt has a slow, self-adjusting resiliency that protects bearings by cushioning sudden loads.

This belt's live, dynamic grip and pull transmits more power, with less maintenance.

Write for details on this modern short center drive.

SC-32

CHAS. A. SCHIEREN COMPANY

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80 Years in Business

Branch Offices in Chicago, Dallas, Denver, Detroit, Newark, New York, Philadelphia, Pittsburgh, Salt Lake City & Toronto, Can.

Leather Belting Leather Packings Leather Rollers

Accounts for Less of The Nation's Total Business

New York

• • • The number of small businesses in this country today, per thousand of population, is as large as at any time in our history and numerically there is no downward trend in sight, according to A. D. H. Kaplan, economist.

This does not rule out the probability that the next few years will see a weeding out among small businesses that mushroomed during the war and postwar sellers' market.

While small business has maintained its strength in numbers, it has lost some ground in the proportion it does of the nation's business. Three main factors will affect its future vitality, according to Kaplan: first and foremost, improved management; also greater availability of equity capital and an improved long range program of federal taxation.

In reviewing the present state of small business, Kaplan points to its importance for a healthy free enterprise economy and for our democratic society. In 1939, small business represented the source of 11 million jobs. If it is to contribute its future share to high productivity and employment, we should look to small business for 14 million jobs.

Allis-Chalmers Earnings

Milwaukee

• • • Allis-Chalmers Mfg. Co. on Nov. 2 announced net earnings for the third quarter of this year to be \$3,562,854, equal to \$1.30 a share of common stock after preferred dividend requirements of \$292,873.

Net earnings for the first 9 months of this year were \$9,869,512 or \$3.58 a share of common stock after preferred dividend requirements were taken.

Billings for the third quarter of 1948 amounted to \$78,998,158 compared with \$57,643,339 for the third quarter of 1947. Unfilled orders on the books as of Sept. 30 amounted to \$165,506,027 as compared with \$160,000,746 on Sept. 30, 1947. In considering the unfilled order figures, it should be remembered that tractor orders as handled by this company are not booked until the tractors are shipped.

PAGE

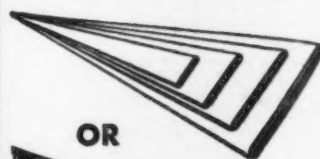
Stainless Steel

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PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE

In Business for Your Safety

Criticizes Tactics of Aluminum Producers In Acquiring Scrap

Chicago

••• Carl H. Burton, secretary of the Aluminum Research Institute, criticized the activities of primary producers and fabricators of aluminum in their methods of acquiring scrap. He charged that the activities of these producers had affected the stability of the secondary aluminum industry. This action, Mr. Burton declared, has contributed to rising prices and gray markets, and has served to divert the regular flow of aluminum scrap from the smelters.

Mr. Burton made this attack in an address before the national convention of the American Die Casting Institute in Chicago recently. As a result of this action by primary producers and fabricators, the speaker told the group, die casters, along with other casting operators, are confronted with a substantial decrease in the amount of metal available. He warned that the aluminum smelting industry, together with 3000 nonintegrated foundries would not submit "to being squeezed into insignificance without retaliation."

The speaker declared that representatives of the producers are advising their customers to return their processing scrap so they may get more sheet aluminum. The speaker declared that this indicates an attitude of absolute indifference to the casting industry and its customers. He charged that aluminum fabricators and users of wrought shapes, either directly or through scrap brokers and dealers, are purchasing scrap to send to producers and fabricators in an effort to get increased allocations.

Such deals, the speaker declared, were vicious. He continued that unless these activities are stopped, it will drain off the bulk of the metal supply to die casters. The speaker predicted that the secondary aluminum supply for next year will fall sharply because of the scrap buying activities of primary producers. Primary production next year, Mr. Burton estimated, will be 1.2 billion lb, or the same as 1948. Conservatively, secondary production should be 35 pct of the primary output. The speak-

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.. The fast tractor-footed load-hustlers

• You've got a crane with hook or magnet anywhere you want it around your yard exactly when you want it—when a Roustabout is on the job. Fast, powerful, this mobile load-hustler gives you low cost materials handling outdoors all around your plant to match your indoor efficiency. It keeps things organized, on the move, prevents costly delays—no waiting for crews from other jobs. Built for years of overwork—ball-bearing boom turntable, all gears in oil. Capacities to 7½ tons—it's the answer to your yard problem. For complete facts... write to Dept. D-6.

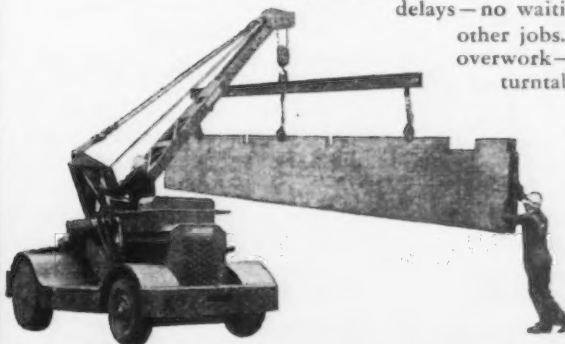


Photo courtesy of Industrial Power Division, International Harvester Company



HUGHES-KEENAN CORPORATION

DELAWARE, OHIO, U. S. A.

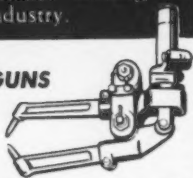
Load-Handling Specialists since 1904

EQUIPMENT that takes the guesswork out of RESISTANCE WELDING

Here are seven reasons why
Progressive today is the largest
supplier of resistance welding
equipment to industry.

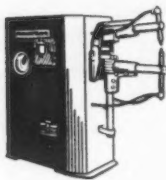
STANDARDIZED GUNS

57000 varieties
on one chassis
alone, through in-
terchangeable jaw
extensions and points. Bulletin No. 402



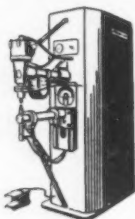
ROCKER ARM WELDERS

For all kinds of
light to medium
duty jobs. An up-
to-the-minute
"triple threat": real
"beef", real speed,
and real adaptabil-
ity. Bulletin No. 702



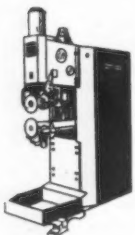
PEDESTAL SPOT WELDER

The "universal" spot
welder. Built to take it,
and how! Quickly ad-
justed to a variety of
jobs. Bulletin No. 503



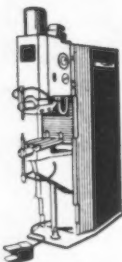
ROLLER HEAD SEAM WELDERS

Another Progressive
"first". The roller head
follows changes in metal
thickness uncannily. You
can seam weld faster and
better. Bulletin No. 804



ROLLER HEAD PRESS WELDERS

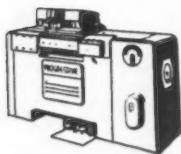
For either projec-
tion or spot welding.
Here, too, the roller
head speeds follow-up
—gives better welds.
Rigid? Take a look at
the frame in Bulletin
No. 603



FLASH WELDERS

Combine the ad-
vantages of standard
and special machines.
More features than
you would believe
possible on a stand-
ard machine.

Bulletin No. 204



Plus SPECIAL MACHINES

IT **PAYS** TO WELD
PROGRESSIVE
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NEWS OF INDUSTRY

er told the group that this would
mean approximately 420 million lb
of secondary production in 1949.
"However," he continued, "it
would appear that the established
ratio against primary production
will not apply in 1949.

Scrap Men Elect Officers

• • • At a recent meeting of the
Northern Ohio chapter of the In-
stitute of Scrap Iron & Steel Inc.,
all officers were re-elected with the
exception of Mr. Monroe Zipp, who
has been replaced by Mr. Myron
J. Urdang, of The A. Shaw Co.,
Cleveland, as secretary.

Mr. Jack Levand, Luria Bros. &
Co. Inc., Cleveland, is president;
Mr. Joseph B. Horwitz, Joseph B.
Horwitz Co., Cleveland, vice pres-
ident; Mr. I. B. Bennett, I. A. Bar-
nett Co., Barberton, second vice
president, Mr. Jack Oettinger, Ty-
roler Iron & Steel Co., Cleveland,
treasurer; and Mr. Myron J. Ur-
dang, The A. Shaw Co., Cleveland,
secretary.

Those elected to the executive
committee are: Abner L. Cohen,
The M. Cohen & Son Co., Cleve-
land, chairman; James Kulka,
Kulka Steel & Equipment Co., Al-
liance; Paul H. Hamel, The By-
Products Iron & Steel Corp.,
Cleveland; Morris Kline, State
Metals & Steel Co., Canton; A.
Knofsky, Warren Scrap Iron &
Metal Co., Warren; Harry A. Led-
erer, Lederer Iron & Steel Co.,
Cleveland; Lewis Miller, Columbia
Iron & Metal Co., Cleveland; S. H.
Schachtel, The Philip W. Frieder
Division, Luria Steel & Trading
Corp., Cleveland; Browne A. Sha-
pero, The Max Friedman Co.,
Cleveland; and Raymond Wilkoff,
Apex Steel Supply Division, S.
Wilkoff & Sons Co., Cleveland.

Postwar Payroll Record

Seattle

• • • Boeing's payroll, hit the 20-
000 mark last week, and the com-
pany announced that it was seek-
ing at least 2000 more men for fac-
tory work. This is the highest pay-
roll the company has had in its
post-war years, and also its biggest
peacetime payroll for the Seattle
plant.

The increase swells Boeing's
monthly payroll to \$6,400,000 and
the yearly payroll to \$77 million.
At present the firm is working on
a \$300 million backlog.

ISN'T COMMON SENSE

COMMON SENSE in the shop would
seem to call for careful cutting fluid
application, because oil that improves
one operation may not be right for
something different. There just isn't any
"one shot" cutting fluid that can do a
large percentage of all jobs! Consider
all the variables—the wide variety of
speeds, feeds, materials, tolerance and
finish requirements encountered in ma-
chining operations in one shop. Those
are the considerations that make it
economical in the long run to be sure
the cutting fluid you use is scientifically
correct. "On-the-job" tests help you
determine what cutting oil qualities are
needed, and may even result in a de-
crease in the number of oils now used.
It is plain common sense to call in cut-
ting oil experts... people with a sound
background of practical experience who
can be relied upon to recommend the
right cutting fluid for the job.

—Chip

SOLVOL

water mixed cutting compound

Solvool is more than just a high grade, emul-
sifiable cutting fluid. It is a unique super
soluble product with the extra metal cutting
qualities that will solve some of your ma-
chinery problems and help eliminate pro-
duction headaches. Ask for literature.

Another Time-Tested
Stuart Product

STUART service goes
with every barrel

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EST. 1845

2737 SOUTH TROY STREET, CHICAGO 23, ILL.





DOES CUT FINISHING COSTS

FISHING REEL MFR. REPORTS . . . (NAME ON FILE)

"The cost of finishing 11,000 crank plates by hand involves 268 hours at \$1.18 per hour for a total of \$316.00.

"The cost of finishing the same by Roto-Finish involves 138 hours at 30c per hour or a total of \$41.00. The net saving is \$275.00."



Untouched illustration shows crank plate for fishing reel; above, before Roto-Finish deburring and finishing; below, after Roto-Finishing.

"Such savings are possible in your finishing department, too! See how Roto-Finish produces a semi-lustrous surface uniformly on one or a thousand pieces; how it handles precision work. Send sample die castings, stampings, machined parts, forgings for processing. Include finished part for guide. No obligation! **THE STURGIS PRODUCTS CO.,**

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Roto-Finish Limited, London, England
A. Flavell Pty. Ltd., Melbourne, Australia

ROTO-FINISH

THE ENGINEERED
MECHANICAL FINISHING PROCESS

NEWS OF INDUSTRY

Porcelain Enamellers Review Developments Within Their Industry

Urbana, Ill.

• • • Attendance surpassed all previous Porcelain Enamel Institute Forums as enamellers gathered at the 10th annual meeting recently at the University of Illinois to hear technical papers on problems and new developments in enameling. A lively interest was shown in the proceedings by approximately 250 representatives from enameling plants.

Increased interest on the part of the porcelain enamel industry in recent years in annual PEI forums has been due in part to the strenuous efforts of the institute to publicize porcelain enamel to offset inroads made by the new synthetic finishes. This aspect was discussed during the address of welcome by M. L. Enger, Dean, College of Engineering and C. D. Clawson, president of PEI and president of Ferro Enamel Corp.

Highlighting the subjects discussed this year was a panel discussion on the application of cover coats directly on steel. Papers in this group discussed titanium enamel, a relative newcomer with superior characteristics; titanium enameling steel which does not warp during firing; and low temperature enamels and their application. Papers describing applications and new developments in ceramic coatings and enamels for military purposes including jet engines and naval equipment also caused considerable interest.

The first paper by D. R. Goetchius, Ferro Enamel Corp., reviewed titanium enamel developments with a discussion of general properties. Commercial use of this enamel started in 1945 and this paper outlined progress and improvement since that time. With titanium enamel, thinner coats with better bonding combined with high resistance to chemical attack and good workability characteristics are claimed. This discussion was followed by a paper on the application of titanium enamels by Harold Wilson, Vitreous Steel Products Co.

In the panel discussion on application of cover coats directly on steel was a discussion of special steels and their preparation for enameling by Frank R. Porter, Ceramic Engineer, Inland Steel Co.

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Constant Pressure!



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Exhaustors**

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- Quiet and Vibrationless
- Only One Moving Part . . .

Power consumption varies with the load and a constant pressure is maintained through the entire capacity range.

Only two bearings—located well outside of the housing—require lubrication.

External bearings assure clean dry air at all times.

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Allen-Billmyre Blowers and Exhaustors are highly efficient for Agitation and Aeration . . . Manufacture of Gases, Acids . . . Combustion Processes . . . Conveying . . . Cooling and Ventilation . . . and all low Pressure and Vacuum Requirements
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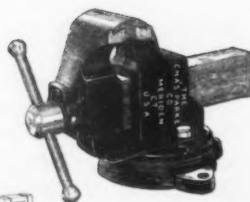


Parkers hold everything!

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Coming soon—a great new line of hinged pipe vises and woodworking vises. Parkers are sold through leading distributors only. The Charles Parker Co., Meriden, Conn.

Parkers are unit-packaged—factory new to you.



PARKER VISES
America's First Vise Maker



Inland manufactures titanium steel which is said to eliminate warping when firing high temperature enamels.

Two papers on 1500°F type of enamels included "Shop Processing of Titanium Enamels Direct to Titanium Steel" by John L. Lannan, Westinghouse Electric Corp., and "Pickle and Millroom Practice and Procedure for Application of Titanium Enamel Direct to Titanium Steels" by John C. Swartz, also of Westinghouse.

These were followed by a discussion on the application of zirconium and other types of enamels by M. E. McHardy, Hussman Refrigerator Co. Mr. McHardy stated that the introduction of titanium steel had been a big step forward towards solving the industry's goal of reducing warpage, enamel thickness, and process defects.

"Controlling Outgoing Quality of Manufactured Products," a paper by Waldo W. Higgins of A. O. Smith Corp., caused considerable interest as did a discussion on the control of liquid and airborne wastes from porcelain enameling by H. S. Kline, Frigidaire Div., General Motors Corp. Since the Water Pollution Control Act was passed in June, waste treatment has become a major headache in the enameling industry. Mr. Higgins outlined several methods for treating pickle wastes.

Two other papers in this group were "Personnel Safety and Health Hazards in The Enamel Plant" by Russell Frank, Ferro Enamel Corp., and "Budgeting Expenses in the Enamel Plant" by C. S. Pearce, Secretary, American Ceramic Society.

Special design racks for use in continuous furnaces were described by A. Rasmussen, Fahrlooy Co., in a paper on the design, construction and maintenance of burning tool equipment. This was followed by "Survey of Drying Practices in the Porcelain Enamel Industry" by George N. Tuttle, Benjamin Electric Co.

A paper which caused considerable interest and discussion described common defects occurring in processing and how to repair them. This has always been a ticklish problem and it was evident from the questions asked that many methods are currently used with varying degrees of success. The paper was presented by John L.

When HEATING FURNACE Repair and Outage Costs Climb



Remember REMMEY RM SEMISILICA BRICKS

Heating furnace roofs, open hearth regenerator roofs, hot blast stoves and other mill furnaces operating continuously enough to cause "first quality" and "super duty" brick to vitrify and spall... yet which are shut down frequently enough to cause silica brick to spall... need Remmey RM semisilica brick.



RICHARD C. REMMEY SON CO.
Philadelphia 37, Pennsylvania

McLaughlin, Chicago Vitreous Enamel Co.

Results of investigations by the Army and Navy in the application of ceramic coatings to withstand high heat in jet engines and corrosion in sea water gave considerable insight into the use of porcelain enamels as an engineering material of the future. Although most of this work is still in the experimental stage, Major R. A. Jones, Air Materiel Command, USAF, predicted that ceramic-coated metals may be used to conserve strategic materials in his paper, "Application of Ceramic Coatings to Aircraft Power Plant Construction."

A primary requirement in Naval service is the development of a means of applying porcelain enamel locally without furnaces. Forrest R. Nagely and J. R. Chilcote, Bureau of Ships, U. S. Navy, discussed research work on porcelain enamel applications and described a method of flame spraying in the repair of ceramic coatings in their paper on the development of enamel coatings for shipboard service.

A progress report on porcelain enamel research at the National Bureau of Standards was presented by Allen C. Francisco, National Bureau of Standards. At the annual forum banquet R. R. Trubey, Baltimore Porcelain Steel Corp., described a private enterprise profit sharing system which has been highly successful at his plant and others.

Strike Idleness Trends Continue Moving Down

Washington

...Despite a recent rash of labor disputes, strike idleness trends continue downward. Fewer workers were involved in new strikes during August than in any month since February, Bureau of Labor Statistics reveal.

To date this year, only one out of each 30 workers went on strike at one time or another, the average striker losing 10 days of work. For the same period last year, the figures are one out of 23 workers and 15 days off the job.

Although 335 new strikes began during August, BLS says, most of them were relatively small. Largest was the International Harvester Co. stoppage, involving some 25,000 workers.



to reduce time ... expense...tool wear

The free-machining characteristics of Holliday Speed Treat plate saved considerable time and money on this heavy machining job. Made by the Rheem Manufacturing Company, Stockton, Calif., this back-up plate for a boiler inspection press was machined from 3 1/2" Speed Treat plate. Work included step machining, drilling of eighty-eight 25/32" holes... and the drilling and tapping of sixteen 5/8" holes. When you have a similar job... savings of better than 35% in machining costs can be effected through the use of Holliday Speed Treat (.45% carbon) or Speed Case (.20% carbon) Steel Plate.

W. J. HOLLIDAY & CO., INC.

Speed Case - Speed Treat Plate Division
HAMMOND INDIANA
Plants at Hammond and Indianapolis

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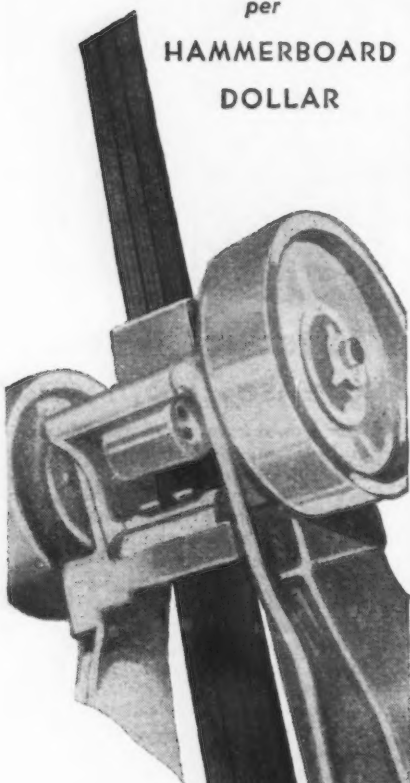
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SPEED TREAT
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NEWS OF INDUSTRY

Government Must Tell Businessmen What Can And Can Not Be Done

Chicago

• • • Senator Homer Capehart, speaking to the Chicago Assn. of Commerce at a luncheon held here recently declared that the time has come when government agencies must spell out to businessmen exactly what can and what cannot be done. He told the meeting that he had never heard so many "buts" as when questioning FTC lawyers as to the meaning of the Cement Case decision which outlawed multiple basing point selling.

The proponents of exclusive f.o.b. pricing are largely economists the senator said. "They believe we would have a more perfect economic structure if all goods were sold on an f.o.b. mill basis. I am not now prepared to say they are wrong. I will continue to have an open mind on the subject until I have heard all possible views."

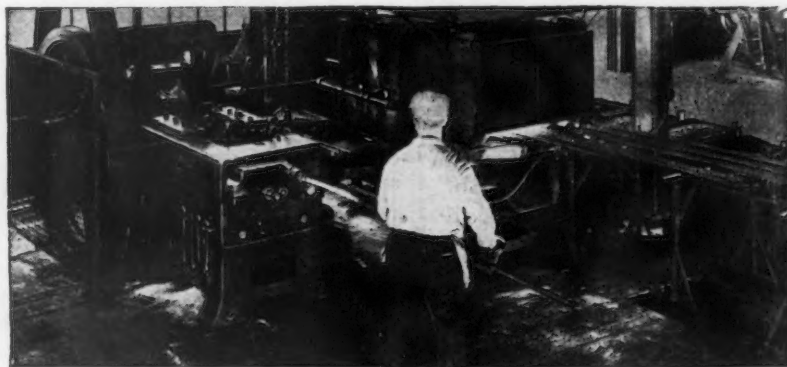
The Senator declared that the re-

organization of American business on an economic basis of universal f.o.b. mill pricing may produce a more perfect economy, but a matter of such magnitude that will change the economic structure of the country should not be put into effect except at the direction of congress. He declared, "It is not only the right of Congress but their obligation to decide what should be our public policy and put it into law."

The senator outlined the timetable of the Capehart Committee's activities in regard to their investigation of the Cement Case decision. He told the group that public hearings will start Nov. 9 and they hope to finish the hearings by the end of January next year. After preliminary hearings the committee will hear from government lawyers. They will then hear from business men who will tell the committee how the law thus far has effected their business.

It is planned that they will hear from both buyers and sellers in about 20 basic commodities. The first witnesses will be from the

This is how STROM BALLS are born



A heading machine cutting sections from heated steel rods and compressing them in a die to a rough spherical shape.

The steel is carefully chosen and inspected, even before it gets to the heading machine. After being "born" here, balls are carefully "brought up," through a long series of grinding and lapping operations, to the unbelievably high standards of finish, sphericity and precision which have made Strom Metal Balls the standard of Industry. Strom Steel Ball Co., 1850 South 54th Avenue, Cicero 50, Illinois.

Strom BALLS  **Serve Industry**

Largest Independent and Exclusive Metal Ball Manufacturer

steel, beet sugar and cement industries. The committee will also hear the testimony of the various chambers of commerce around the country and will then hear from economists and members of the commission.

Senator Capehart said that they would listen to three of those economists as well as economists from other departments of the government and also economists of the committee's own choice. The committee has appointed an advisory council of 47 industrialists to aid in finding the answer to the present \$64 question. These members include businessmen from all sections of the country, many of which represent small business.

The senator said, "This council is at liberty to reach any conclusion and follow any course in making its study which it thinks proper and beneficial." After all hearings are completed the committee will make its recommendation to Congress.

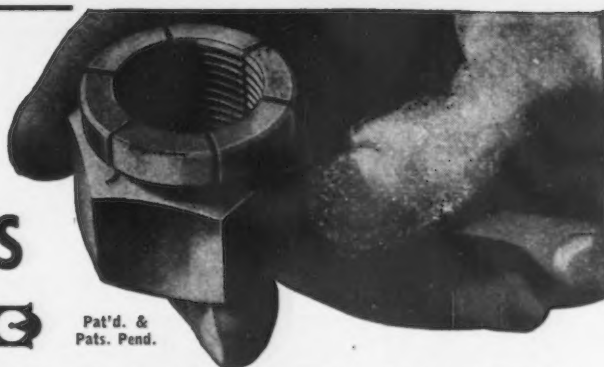
The senator declared, "We cannot permit any pricing policy to be the law of the land which will prevent the small businesses of the country from continuing, hinder their growth, or impair their efforts to compete with larger competitors. We must determine when, if ever, it is to the best interests of our national economy to deny any seller the right to compete for any business in any distant market, when he can do so only by absorbing all or part of the freight to get to that market."

Immediately following Senator Capehart's talk William Simon, general counsel of the Senate Trade Policies Committee, outlined for the members of the Chicago Assn. of Commerce and Industry, "The legal issues arising out of the decision of the Cement Case." Mr. Simon reviewed the past history of the Federal Trade Commission and proved rather conclusively that the FTC charges against industry have habitually been that of price discrimination based on the mill net theory. He emphatically declared that the FTC's prime interest has not been one of conspiracy charges against industry but the commission's pet theory of "mill net" has always been present behind the smokescreen of conspiracy charges.

ASK FOR SAMPLES

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Pats. Pend.



SELF-LOCKING NUTS

The one-piece, all-metal, resilient "Flexloc" is becoming widely accepted, because it is processed to have an exceptionally uniform torque, and because it is a stop, a lock and a plain nut all in one. All its threads are "live" and load-carrying; "Flexloc" accommodates itself to a wide range of thread tolerances, and can be used over and over again without losing much of its torque . . . is not affected by temperatures commonly met within the industrial field of Mechanical Engineering . . . and being a "stop" nut, it stays locked in any position on a threaded member . . . and last, but not least—it won't shake loose!

The *Thin* "Flexloc" has become very popular because its tensile is so high and the space it occupies so small.

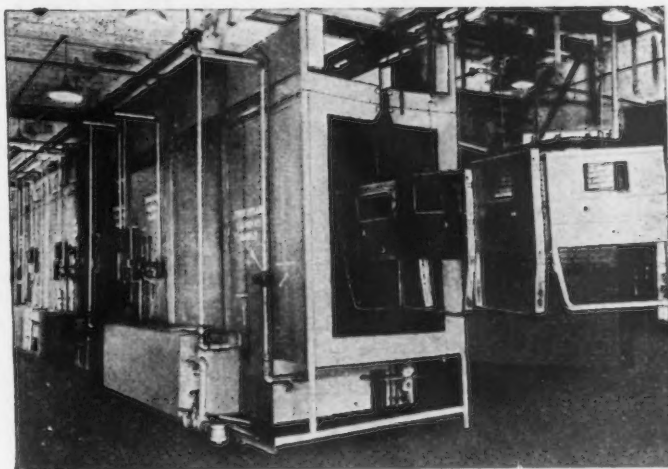
Sizes from #6 to 2" in diameter—in "regular" and "thin" types—in NC and NF thread series. Write for "Flexloc" Catalog.

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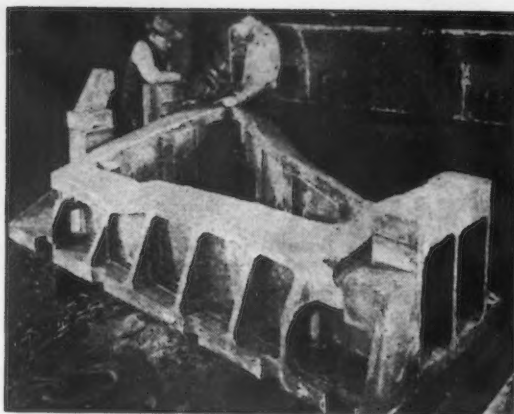
Cab doors for
AUTOCAR
Trucks being
automatically
cleaned, phos-
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and dried in a
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This METALWASH phosphate coating machine provides an ideal surface for a lasting paint finish on truck body parts. Cleaning and phosphating are entirely uniform since the cycle is automatically controlled. Continuous operation, built around the plant conveyor line, eliminates handling problems. Let METALWASH engineering solve your metal cleaning, chemical treating and drying problems.

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Compared to the expense of machining this quarter panel, the cost of the casting is trivial. If a defect appeared after many hours of machine time had been spent on such a job, much more than the cost of the casting would be lost.

This doesn't mean you have to pay considerably more for sound, machinable castings. In fact, when you get that kind of castings from us, they probably won't cost you anything additional except the freight.

You'd be surprised to know how many

customers at a distance are coming to us for gray iron, alloy, and *Strenes Metal* castings to save machining cost and grief. It's because they have learned by experience that it pays to get castings that don't show up blowholes, cold shuts, hard spots, cracks, and sponginess in the course of machining.

We do the same class of work on job castings as on *Strenes Metal* cast dies. That may sound like a broad statement, but we can prove it. If you want the proof, write or phone us.

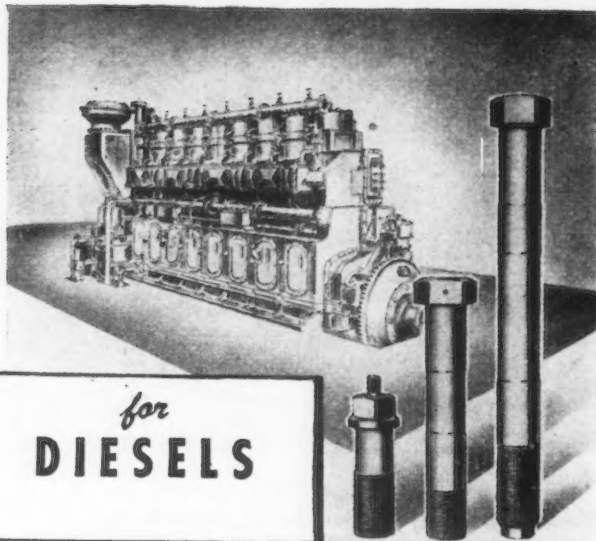
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CASTINGS**

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FOR over 30 years ERIE has specialized in the manufacture of high quality bolting. We use the very latest equipment for heat treating, machining, grinding and threading. We are certain that we can produce better bolting at a saving to you because we are specialists—send us your bolting specification for our estimate.



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STEEL CORPORATION
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NEWS OF INDUSTRY

Develops New Rivet Studs That Prevent Corrosion

Cleveland

• • • Nelson Stud Welding Div., Morton-Gregory Corp., has gone into volume production on a new type of composite aluminum and mild steel rivet stud, which overcomes the corrosion problem usually encountered when aluminum roofing and siding have been secured with steel plated fasteners.

Similar in its overall appearance to the regular steel Rivweld rivet studs, the new stud consists of a mild steel female stud in which a cross-shaped insert of aluminum has been so fitted that there is no room for collection of moisture, thus relieving the electrolytic problem.

With mild steel in the flux-filled end of the stud, which is secured to steel purlins, struts or girts, and aluminum in the upper portions of the stud which come in contact with the aluminum sheet, there is no opportunity for electrolytic action at any point.

Nelson has also developed a new aluminum-surfaced neoprene washer for use in conjunction with the composite stud.

Five Foundrymen Honored

Cleveland

• • • Gray Iron Founders' Society at its 20th annual meeting in Atlantic City honored five prominent gray iron foundrymen for outstanding service to the society and the gray iron foundry industry.

Arthur E. Hageboeck, executive vice president, Frank Foundries, Inc., Moline, Ill., received the first gold medal award of the association, together with a parchment scroll for his contributions to the general welfare of the industry and his accomplishments in establishing foundry cost groups throughout the country.

Other recipients of illuminated, commemorative scrolls were: Howard A. Stockwell, treasurer, Barbour Stockwell Co., Cambridge, Mass., for outstanding service to the society which he served as president during 1947 and 1948; John M. Price, president, Ferro Machine & Foundry Co., Cleveland, for his exceptional leadership in

connection with the formation and financing of the Foundry Educational Foundation.

Also Arthur J. Tuscany for his years of service as the society's first general administrative officer, and Philip Frankel for his wise leadership and sound counsel

Railroad Uses Infra-Red Light in Inspecting Parts

Baltimore

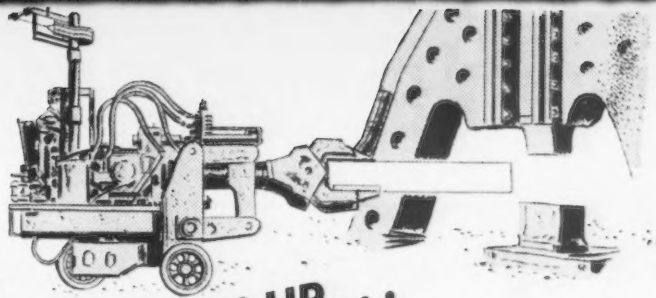
••• **Infra-red light**—or "black light," as it is commonly called—has been put to work by the Baltimore and Ohio Railroad to add to railroad safety. The infra-red rays are now being employed to inspect the axles of locomotives, tenders and cars, according to A. K. Galloway, general superintendent of motive power and equipment for the road.

In the past, such an inspection has required manual handling of the heavy axle and has taken much time. The new automatic device permits an axle to be thoroughly inspected in less than 3 min.

The inspection device employs a patented process known by the name of "magnaglow." It has been installed in the B & O's wheel shop at Glenwood, near Pittsburgh, Pa. B & O shop engineers, under the direction of F. B. Rykoskey, supervisor of shops, developed the accessories that make it possible for the axles to be handled automatically and rapidly during the application of the magnaglow process.

The axle to be inspected is first cleaned to remove any accumulation of grease and dirt. It is then placed on a bracket which feeds it by gravity onto several rollers. As the axle revolves slowly on these rollers, an oil solution containing tiny particles of iron is sprayed upon it. Starting at each end of the axle, two electro-magnetic coils move slowly over it toward the center.

Meanwhile, the infra-red light is played on the axle. This causes the oil solution to glow with a phosphorescent light wherever there is a small flaw or crack. This slow rotation, combined with the slow sideward movement of the coils, allows the inspector to check all of the axle without any manual handling. As the inspection is completed, the axle is discharged from the rollers onto a conveyor, the whole cycle being automatic.



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If its more production at less cost you're looking for, consult us about Brosius Auto Floor Manipulators—dual purpose machines for manipulating forging blanks under hammers and presses and the charging and drawing of heating furnaces.

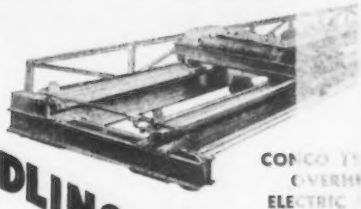
We also design and manufacture Charging Machines, Goggle Valves, Clay Guns, Cinder Notch Stoppers, Dry Slag Granulating Mills, Flue Dust Conditioners, Coke Tumbling Barrels, Soaking Pit Cover Carriages, Clay Shell Buckets and Automatic Dump Buckets.

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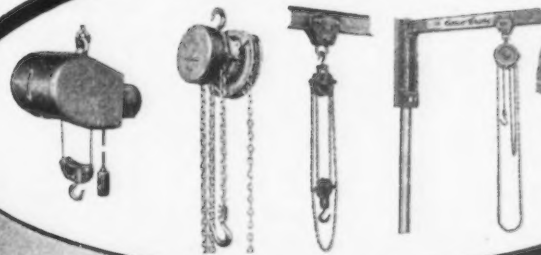
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● WRITE today for complete information on the CONCO line of hand-powered and electric cranes, hoists and trolleys — a complete line, tried and proven for over twenty years. CONCO engineers are qualified to recommend the right type of handling equipment for faster, more economical production in your shop. Write us now, and take advantage of our long experience in moving more materials, faster and at less cost.

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MACHINE TOOLS

... News and Market Activities

Prospects for Immediate Improvement in Sales Not Encouraging

••• While prospects of immediate improvement in the machine tool sales outlook are practically nonexistent at the moment, according to industry observers, there were signs this week that although major segments of the industry might be damp in spirit, they were keeping their powder dry.

A spokesman for the industry noted out this week that the democratic victory at the polls would not alter the outlook for ECA machine tool orders, in fact, it actually guarantees that ECA will be continued. Estimates of this will mean to the industry new orders can be had for a long time, but the latest figure is \$100 million, and it is believed that the end of this business will be in December.

Optimistic but somewhat pessimistic note was also sounded this week in Houston by former Under Secretary of State, W. L. Clayton, who said that WAA's Clayton formula, which partly contradicted Wall Street, is with the prediction that a new administration and a new Congress will be a boon to business.

As for the financial and industrial interests are wrong in connection with it (the election) will be "business," he said. "It is a constructive and hopeful thing to place all responsibility in the hands of one administration."

At the event, it was evident that the long-slumbering defense industry was getting under way. It was reported this week the lease of surplus government owned machine tools can be used for production of machine tool equipment for the Air Force plant is located at Garden City, N. Y., the other in New York City. The Johnson City plant is operated during the war by the Hamilton Rand Co., which made airplane propellers. The new plant was operated during the war by A. O. Smith for production of airplane engine equipment.

On the foreign sales front, some of the major segments of the industry were actively renewing

Industry Exporters Feel That Biggest European Market Exists in Germany

o o o

their contacts with German machine tool dealers, perhaps in anticipation of the development of the active machine tool market that reportedly requires only capital and a little latitude of industrial movement in Germany. It has been firmly alleged by a number of well-informed export sales operatives in the industry that Germany is where the biggest European machine tool market lies and subsequent events tend to emphasize the sagacity of that statement.

In Cleveland, it was reported that earnings of National Acme Co. in the third quarter dropped to \$242,437 from \$476,442 in the same quarter a year ago. Share earnings declined to 49¢ from 95¢. Nine-month earnings this year were \$912,973 or \$1.83 a share compared with \$1,698,148 or \$3.40 in 1947.

Contract tool and die shops report decreasing backlogs, although their physical volume of business is about the same as last year's. The important decline is in new orders, according to trade sources, which are currently less than shipments. Most shops are in position to give the quick deliveries manufacturers are requesting, despite the fact that employment is down somewhat.

As of Sept. 1, members of National Tool & Die Manufacturers' Assn. reported 99 per cent of their dollar volume for the corresponding period of 1947. Steel requirements of the tool and die shops are relatively small and they have not been directly affected by the steel shortage, although some producers of die sets have been unable to expand for lack of an historical background with a steel producer.

In Detroit trade sources report a decided down turn in prospective business estimates. There has

been a noticeable easing of pressures behind tooling programs for the new automatic transmissions. The Saginaw program for General Motors is continuing, but at a slower pace. A Detroit transmission program which was expected to open up has turned unexpectedly quiet, according to supplier sources. Anticipated ordering for the new Ford automatic transmission, it is indicated, has not materialized.

Hardest hit in this area have been the builders of special machine tools. Some well-established shops, it is now reported, have been forced to make substantial reductions in their staffs because of the lack of orders. This applies to several of the better established machine tool builders here.

There is still some spotty buying by the larger tool and die shops, but the volume is not large. Up to the present time, there has been little buying to replace machine tools now being operated under lease from the government. It had been expected that much of this equipment would have to be replaced within the next 6 months.

In Philadelphia, Fiat Automobile Works, Turin, Italy, has contracted with the Budd Co. for the construction of dies, jigs, and other tools here, according to a statement by Armando Fiorelli, managing director of the Fiat Works.

Mr. Fiorelli, who is here for the consummation of the contract, said that the shortage of facilities for machine tool production in Italy and the fact that his firm is attempting to cooperate under the Marshall Plan (ECA) by achieving maximum employment and production as rapidly as possible make this step necessary.

Fiat is producing a new 4-cylinder automobile and hopes to reach an output of 300 cars per day by the end of 1949. Fiat has built automobile bodies since 1935, using Budd methods under a licensing arrangement, but this is the first time Budd Co. has built tools for the Italian firm.

HALF

pH control

the other

HALF

SUPER-DRAW

Half of this message has to do with NORTHWEST products and processes for chemically cleaning ferrous and non-ferrous metals preparatory to plating, vitreous enameling, painting, etc., each problem involving a specific programming of one or more of the thirty-five standard NORTHWEST Cleaning Compounds including Electrolytic, Immersion, Solvent, Spray, and Water Wash types . . . the "Lo-Hi" pH process of chemically cleaning metals, preparatory to plating, porcelain enameling, etc., makes practical a control that management can plan on in these departments regardless of the type of metal or soil . . .

is concerned with metal forming lubricants developed for ferrous and non-ferrous metals in both pigmented and non-pigmented form . . . SUPERDRAW products are specifically compounded for: 1. Brass and Brass Alloys, 2. Cold Rolled Steel, Enameling Iron, Stainless Steel and Aluminum, 3. Alloys of Steel, Aluminum and Copper . . . SUPERDRAW compounds will handle light, medium, and heavy operations . . . may be applied by brush, roller, spray, or dipping . . . A request on your letterhead will bring a technician to consult you on your drawing and cleaning problems . . .



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Note your specific interest on the coupon below and attach to your letterhead. It will bring complete information.

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Stainless Steel ☐
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pioneers in pH cleaning control — serving you since '32

NONFERROUS METALS

... News and Market Activities

Cadmium Price Raised to \$2.00; Producer Raises Zinc 2 Cents

New York

••• All producers advanced the price of cadmium to \$2.00 per lb on Monday, an advance of 10¢. The possibility of an increase in cadmium prices was foreseen in industry circles more than a month ago when the demand for the metal pyramided. Anode producers have withdrawn prices for the time being as they are studying the possibility of a need for a larger spread than the 10¢ which has applied in recent months.

An increase of 2¢ per lb in the price of zinc was put into effect by the Eagle Picher Co. on Friday, following an increase of 13.5¢ an hour to its smelter workers. Early this week no other producer had taken action to follow, but those pricing on the weighted average weekly price will obtain an automatic increase. Most other producers are out of the market awaiting further developments. The Joplin concentrates price has been advanced from \$98 to \$110 a ton. If the increase is adopted generally, the price of Prime Western becomes 17.50¢ East St. Louis. High Grade would become 18.50¢ delivered.

The copper shortage is much more acute now than it has been. The strike of railroad workers at Kennecott's Utah mine was still in effect early this week, causing a loss of domestic production of approximately 25,000 tons a month. There are no compensating factors to offset this lost tonnage. Consumers are desperate and are avidly searching for December tonnage. Producers are unable to cope with the demand. No major or minor producer has taken ac-

Desperate Metals Shortage, Government Stockpiling Are Inflationary

o o o

tion to advance the price. However, reports of transactions indicate that prices of 26.50¢ and 27¢ have been paid by consumers.

In the face of these inflationary developments, it is learned that the government intends to proceed with its stockpiling program regardless of the shortages and the impact of stockpiling on prices. Copper producers met last week with Michael Schwarz, Bridgeport Brass Co. vice-president, who has been appointed as a consultant to the Treasury Dept. Procurement Div. to expedite the stockpiling of copper. They learned that there was no alternative to a program setting up specific tonnage objectives for each producer. Some producers who have been buyers of copper to meet the requirements of newly built fabricating facilities also will be required to offer tonnages to the government.

The lead stockpiling program is now being expedited by Irwin H. Cornell, former president of St. Joseph Lead Co., acting as consultant. Stockpiling of zinc will go forward regardless of the tonnages already held in the stockpile, and the present critical demand for the metal. Producers of all three metals recognize that if metal is not offered to the government under the present voluntary program, it will surely result in a strict allocations program.

All factors in the market point to increased zinc and copper

prices, but producers are holding back lest general action bring about the imposition of price controls. Competition for copper, brass and aluminum scrap has become acute, causing extreme hardship on customary buyers such as the custom smelters. Copper consumers have entered the scrap market on a large scale because of the shortage of refined metal. They have bid up the price well above what smelters and ingot makers can afford to pay in order to sell at the 23.50¢ market. This scrap is refined on a toll basis with a resultant price well above the market.

Copper cathodes have been sold at 26¢ per lb. With conversion charges, this copper in shape form might reach 28¢. Belgian zinc has been sold in this market at 18.75¢, duty paid.

This week, copper and zinc producers are meeting in Washington with officials of the Dept. of Commerce, Office of International Trade. Although producers are not in receipt of full details of the program, it is known that there is to be an attempt to limit the exports of bonded copper and zinc. No domestic copper or zinc is now being exported. But imported ores and concentrates, refined in this country, are exported under current regulation of OIT. The problem in restricting exports of bonded metal is that such action might result in a reduction of shipments of ores and concentrates into this country.

Heads Combustion Dept.

Washington

••• Dr. Ernest F. Fiock has been appointed chief of the newly organized Combustion Section of the National Bureau of Standards. The increasing importance of combustion research, particularly its application to gas turbines and jet engines, has made the formation of a separate section devoted to large-scale research necessary.

Nonferrous Metals Prices

	Nov. 10	Nov. 11	Nov. 12	Nov. 13	Nov. 15	Nov. 16
Copper, electro, Conn.	23.50	23.50	23.50	23.50	23.50	23.50
Copper, Lake, Conn.	23.625	23.625	23.625	23.625	23.625	23.625
Tin, Straits, New York	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03
Zinc, East St. Louis	15.50	15.50	15.50	17.50	17.50	17.50
Lead, St. Louis	21.30	21.30	21.30	21.30	21.30	21.30

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	38.50
Beryllium copper, 3.75-4.25% Be	
dollars per lb contained Be	\$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	\$52.00
Cadmium, def'd	\$2.00
Cobalt, 97-99% (per lb)	\$1.65 to \$1.72
Copper electro, Conn. Valley	23.50
Copper, lake, Conn. Valley	23.625
Gold, U. S. Treas., dollars per oz.	\$35.00
Indium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$110 to \$115
Lead, St. Louis	21.30
Lead, New York	21.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York	\$75 to \$78
Nickel, electro, f.o.b. New York	42.90
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$93 to \$96
Silver, New York, cents per oz.	74.25
Tin, Grade A, New York	\$1.03
Zinc, East St. Louis	15.50-17.50
Zinc, New York	16.15-18.15
Zirconium copper, 10-12 pct Zr, per lb contained Zr	\$12.00

Remelted Metals

Brass Ingot

(Published prices, cents per lb delivered, carloads)

55-5-5-5 ingot	
No. 115	21.50*
No. 120	21.00*
No. 123	20.50*
50-10-10 ingot	
No. 305	27.25
No. 315	24.25
58-10-2 ingot	
No. 210	33.00
No. 215	31.00
No. 245	25.75*
Yellow ingot	
No. 405	17.50*
Manganese bronze	
No. 421	23.00
* F.o.b. Philadelphia.	

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	30.50-31.00
0.60 copper, max.	29.75-30.50
Piston alloys (No. 122 type)	25.75-26.25
No. 12 alum. (No. 2 grade)	25.75-26.25
108 alloy	25.75-26.25
195 alloy	25.50-26.00
13 alloy	29.75-30.25
AXS-679	26.50-27.00
Steel deoxidizing aluminum, notch-bar granulated or shot	
Grade 1-95 pct-95½ pct.	28.00-28.50
Grade 2-92 pct-95 pct.	27.00-27.50
Grade 3-90 pct-92 pct.	25.50-26.00
Grade 4-85 pct-90 pct.	25.00-25.50

Electroplating Supplies

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	40½
Electrodeposited	34½
Roller, oval, straight, delivered	37.34
Ball anodes	38½
Brass, 80-20	
Cast, oval, 15 in. or longer	35½
Zinc, oval, 99.99	
Ball anodes	
Nickel 99 pct plus	
Cast	59.00
Roller, depolarized	\$2.10
Cadmium	
Silver 999 fine, roller, 100 oz. lots, per troy oz, f.o.b. Bridgeport, Conn.	81½

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	46.00
Copper sulfate, 99.5 crystals, bbls.	9.10
Nickel salts, single or double, 100 lb bags, frt. allowed	18.50
Nickel chloride, 300 lb bbl.	24.50
Silver cyanide, 100 oz. lots, per oz.	62
Sodium cyanide, 96 pct domestic 100 lb drums	16.00
Zinc sulfate, crystals, 22.5 pct, bags	
Zinc sulfate, 25 pct, granules, bbls, frt. allowed	

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.8¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.8¢; 75S-O, 75S-OAL, 36.3¢; 0.081 in., 2S, 3S, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 75S-O, 75S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-O, 33.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 75S-O, 75S-OAL, 47.6¢.

Plate: ¼ in. and heavier: 2S, 3S, F, 23.8¢; 4S-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 75S-F, 75S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4; 35.1¢ to 66¢; 11 to 13, 36.1¢ to 78¢; 23 to 25, 38.2¢ to 1.07; 35 to 37, 45.7¢ to 1.65; 47 to 49, 67.5¢ to 2.41.

Rod, Rolled: 1.064 to 4.5 in., 2S-F, 3S-F, 34¢ to 39.5¢; Cold-finished, 0.375 to 3.5 in., 2S, 3S, 36.5¢ to 32¢.

Screw Machine Stock: Drawn, ¼ to 1 1/32 in., 11S-T3, R317-T4, 49¢ to 38¢; cold-finished, ¾ to 1 ½ in., 11S-T3, 37.5¢ to 35.5¢; ¾ to 2 in., R317-T4, 36.5¢ to 33.5¢; rolled, 1 9/16 to 3 in., 11S-T3, 35.5¢ to 32.5¢; 2 ½ to 3 ¾ in., R317-T4, 32.5¢ to 31.5¢. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.: 2S, 36¢ to 26.5¢; 52S, 44¢ to 32¢; 56S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 75S-T6, 76¢ to 55¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed Base quantity 30,000 lb)

Sheet and Plate: Ma, FSA, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-1.01; 22, 1.12-1.31; 24, 1.62-1.75. Specification grade higher.

Extruded Round Rod: M, diam. in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2 ½ to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢; 1¼ to 1.749, 44¢; 2 ½ to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 55¢; 0.22 to 0.26 lb per ft, per. up to 5.9 in., 61¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.067, ¼ to 5/16, \$1.14; 5/16 to ¾, \$1.02; ¾ to 7/16, 85¢; 1 to 2 in., 65¢. 0.065 to 0.082, ¾ to 7/16, 85¢; ¾ to 1, 62¢; 1 to 2 in., 57¢. 0.165 to 0.219, ¾ to 1, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and shapes		
Hot-rolled	56	45
Cold-drawn	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks		40

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Extruded Shapes	Rods	Sheets
Copper	36.78		37.13
Copper, hot-rolled	33.28		
Copper, drawn	34.28		
Low brass	38.07*	34.85	35.16
Yellow brass	36.76*	33.44	33.75
Red brass	38.55*	35.33	35.64
Naval brass	33.92	32.67	38.61
Leaded brass		28.30	
Commercial bronze	39.29*	36.32	36.63
Manganese bronze	37.51	36.01	42.11
Phosphor bronze, 5 pct	57.80*	56.30	56.05
Muntz metal	33.47	32.22	36.66
Everdur, Herculey, Olympic, etc.	40.43	40.67	41.73
Nickel silver, 10 pct		46.42	44.20
Architectural bronze			32.33
* Seamless tubing.			

Scrap Metals

Brass Mill Scrap

(Cents per pound; add 1¢ per lb for shipments of 15,000 or more)

	Heavy	Turnings
Copper	21½	20½
Yellow brass	15	17½
Red brass	19½	19
Commercial bronze	19½	19
Manganese bronze	17½	16½
Leaded brass rod ends	17½	

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	20.50-21.00
No. 2 copper wire	19.50-20.00
Light copper	18.50-19.00
Refinery brass	18.50*-18.75*
* Dry copper content.	

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer.)

No. 1 copper, wire	19.75
No. 2 copper, wire	18.75
Light copper	17.75
No. 1 composition	16.75-17.00
No. 1 comp. turnings	16.50-16.75
Roller brass	13.00-13.50
Brass pipe	13.25-13.75
Radiators	14.00
Heavy yellow brass	12.50-12.75

Aluminum	
Mixed old cast	16.00-16.50
Mixed old clips	16.25-16.75
Mixed turnings, dry	14.00-14.50
Pots and pans	16.25-16.75
Low copper	18.50-19.00

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	18½-19
No. 2 heavy copper and wire	17½-18
Light copper	16½-17
Auto radiators (unsweated)	12½-12¾
No. 1 composition	15-15½
No. 1 composition turnings	14½-15
Clean red car boxes	12½-13
Cocks and faucets	12¼-12½
Mixed heavy yellow brass	9½-10
Old roller brass	11½-12
Brass pipe	12½-13
New soft brass clippings	14½-15
Brass rod ends	12-12½
No. 1 brass rod turnings	11½-12

Aluminum

Alum. pistons and struts	8½-9
Aluminum crankcases	12-12½
2S aluminum clippings	16-16½
Old sheet & utensils	12-12½
Borings and turnings	6-6½
Misc. cast aluminum	12-12½
Dural clips (24S)	12-12½

Zinc

New zinc clippings	10½-11
Old zinc	8½-9
Zinc routings	4½-5
Old die cast scrap	5-5½

Nickel and Monel

Pure nickel clippings	22-23
Clean nickel turnings	17-18
Nickel anodes	22-23
Nickel rod ends	21-22
New Monel clippings	15½-16½
Clean Monel turnings	11-12
Old sheet Monel	13-14
Old Monel castings	10-11
Inconel clippings	12-13
Nickel silver clippings, mixed	8-8½
Nickel silver turnings, mixed	7-7½

Lead

Soft scrap lead	20-20½
Battery plates (dry)	13-13½

Magnesium Alloys

Segregated solids	8-9
Castings	4½-5½

Miscellaneous

Block tin	82-84
No. 1 pewter	65-67
No. 1 auto babbitt	51-53
Mixed common babbitt	20-20½
Solder joints	22½-23½
Siphon tops	50-52
Small foundry type	21½-22
Monotype	20½-21
Lino. and stereotype	20-20½
Electrotype	18½-19
New type shell cuttings	16½-17
Hand picked type shells	7½-8
Lino. and stereo dross	11½-12
Electro dross	8-8½

Here's a Crane that's Tailor Made for Handling **SCRAP!**

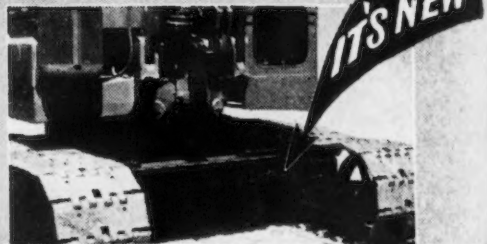


Special Axle:

New type axle has been increased in width and height. Multiple-hinged shoes have been increased in width from 20" to 24". The new UNIT 1020A now has equal stability over both sides and ends. Handles a 45" Magnet with ease.

THE NEWLY DESIGNED UNIT 1020A
With All the Features You Need
... or Ever Will Need!

- Pendant Boom Suspension . . . boom length can be altered without re-reaving boom hoist cable.
- Throttle Lever is within easy reach of operator . . . positive power and speed control at all times.
- Heavier, air-cooled Double Disc Clutches . . . for smooth performance and easy operation.
- Improved Automatic Traction Brakes with sectional linings which are easily replaced without removing shaft from machine.
- New leak-proof Oil Seals . . . keeps lubricants in . . . and dirt and abrasives out.
- New style foot brakes with self-aligning bearings on brake operating shafts. Wider, self-equalizing brake bands which eliminate dragging or scoring.



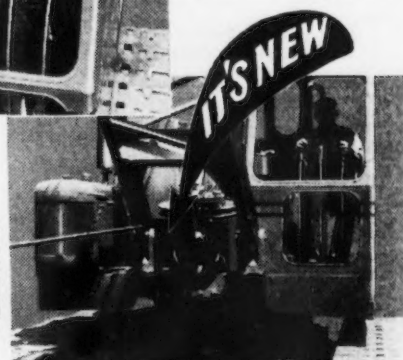
Swing Lock Control:

Hand operated swing lock control within easy reach of operator . . . no more stooping, kicking, or leaving cab for this operation.



New Type Magnet Fairlead:

This elevated Fairlead is especially adapted for magnet operation. It equalizes cable contact on two sheaves instead of one, minimizes unnecessary wear.



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UNIT CRANE & SHOVEL CORP.

6517 W. BURNHAM STREET

MILWAUKEE 14, WIS., U. S. A.

Some Cast Grades Advance Sharply

New York

... Standard mill grades held steady this week in the major market areas, but cast grades advanced sharply in Birmingham and Buffalo while low phos dipped \$1 in Philadelphia to go at \$49 to \$50.

In Birmingham, cast iron reached the highest quotation in the market's history as No 1 cupola cast advanced \$2 to \$70 to \$72 a ton, and cast iron car wheels brought \$63 to \$64.

Clean auto cast jumped \$2.50 in Buffalo to go at \$69 to \$70 while stove plate advanced \$1.50 to \$66 to \$68. It is reported that dealers are giving added attention there to preparation to get top prices for the cast grades.

The market is generally firm and shipments are moving in fair volume. Mills are still careful on their inspection procedures but will take good scrap. Ingot operation continues to hang around 99 pct of capacity and although backlogs are good they must be maintained.

Some sources in the Chicago district report pressure for lower prices while others talk up the market's strong points. The real story seems to lie somewhere in between the two versions. Good scrap is still hard to get in that area and converters are willing to pay premiums. Bundles, however, are moving slower there and numerous installations of balers may affect that market in the near future.

PITTSBURGH—The market showed no price changes during the past week. Brokers reported dealer shipments still falling off. This is due to a seasonal drop in receipts from the South; a seasonal tendency to hold stocks for inventory purposes and a dip in receipts from peddlers. Prices for foundry grades showed no decline though demand from that quarter is reported off somewhat. Big steel companies are still increasing scrap stocks on the ground despite record breaking operating rates. Better quality coke, permitting a reduction in the proportion of scrap to pig iron charged, is said to be one reason.

CHICAGO—Observers here declare that the pressure to change going prices is in-

creasing. The mills are acting like they don't need any more scrap, it is a drug on the market, etc. That they would like to play the price of dealer scrap against earmarked is becoming quite evident. Sellers are talking about the winter months, slow flow from their sources, market looks strong, etc. Somewhere in between lies the eventual level. Good scrap is still hard to find. Converters will still pay premiums. However, bundles aren't moving too well—some dealers are looking for conversion business but this usually requires electric furnace bundles. Everybody and his brother has installed balers in recent months and it will not be surprising if these particular prices broke a little in the very near future. Conversely one small mill last week was paying \$42 a gross ton for clips unbundled.

PHILADELPHIA—The heavy melting market was firm last week at previously quoted prices. Mills are still choosy about shipments and are continuing to reject off-grade shipments. Some brokers report that mills are no longer overly anxious to place orders. There are strengthening influences on the market involved in the car shortage and the longshoremen's strike that went into effect here last week. Low phos grades used in the openhearth were sold \$1 lower last week. All other prices were unchanged.

CLEVELAND—Shipments to consumers here and in the Valley continue to reflect the seasonal shortage of freight cars, which will probably last until December. The market is quiet, although all grades are in strong demand here and in the Valley except blast furnace. Foundries are inclined to be cautious and will probably remain so for the balance of the month, but good grades of cast are showing strength with mills buying heavy breakable. Recent sheet and strip price increases by mills will probably inspire an effort on the part of some segments of the trade toward another increase in scrap prices.

DETROIT—There have been no significant changes in the Detroit scrap market during the past week. Scrap flow has been excellent except where freight car shortages or embargos have interfered with normal movements. Local mills are reported to be comfortable. Some sources have reported indications of softness on cast grades. However, any downward movement in this segment of the market is not yet reflected in local prices. It would not be surprising, however, if recent losses of business by local job foundries and the present lack of activity in Detroit tool and die shops will eventually result in a softening of cast prices.

CINCINNATI—Openhearth grades continue strong here in what might be described as a cautious market, both on the part of the brokers and the consumers. Steel foundries are practically out of the market for the time being and other found-

dries are buying very little. The shortage of freight cars has not, as yet, affected the movement of material in this area although shipments of openhearth grades are holding up. Brokers hint that talk of controls is responsible for the hesitance of some consumers to build up an inventory and are showing some hesitance themselves in bidding the big money for railroad offerings.

NEW YORK—Current price levels are holding firm in this market. Shipments are moving in fair volume and demand is strong although mills are careful in their inspection procedures, especially on bundles. The continued high operating rates and necessity for establishing and maintaining backlogs spur the outlook. As yet, there is no indication that hysteria over controls should exist. What the future will bring forth is another story. The 50¢ drop in chemical borings last week holds in a weak market. Shipments here are down and there are few orders out.

BIRMINGHAM—Cast iron has advanced in price here again to reach the highest quotations for that material in this market's history. No. 1 cupola cast, up \$2 per ton, is bringing as much as \$72. Reflecting substantial inventories at mills, movement of openhearth grades is relatively light. Northern consumers still are refusing to absorb freight charges from Southern points.

BOSTON—There has been more stability in the market here, recently, than there had been in a long time and prices show no change. With colder weather on the way, there is some expectation of an increase in scrap demand, but there is no sign of it yet. Prices are pretty near going price levels. Good cast is in demand, and most foundry grades are moving at normal levels.

BUFFALO—Standard mill grades held steady in a quiet market, with no break indicated in the stalemate between big consumers and dealers. One major yard operator said October receipts were about half of September's tonnage, and so far November was no better. Dealers are giving closer attention to preparation to get top prices, such as \$51 for 2-ft foundry steel, \$70 for clean auto blocks and \$64 for short rail. On the other hand, one of the leading consumers is accepting unprepared openhearth steel at \$3.50 below the No. 2 price and unbundled sheets at \$4 under. This week will mark the end of the heavy canal movement from the seaboard. A 5000-ton cargo is due over the coming weekend by lake freighter from Duluth.

ST. LOUIS—The movement of scrap iron to the St. Louis industrial district has fallen off within the last 10 days, as material is not being gathered in the rural districts. Receipts are below the melt, but mills are said to have an average of 45 days supply in piles. Steel cars axles and cast iron car wheels are up sharply; otherwise prices are unchanged.

IRON AND STEEL SCRAP PRICES

PITTSBURGH

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$42.50 to \$43.00
RR. hvy. melting	43.50 to 44.00
No. 2 hvy. melting	42.50 to 43.00
RR. scrap rails	58.00 to 59.00
Rails 2 ft and under	62.00 to 62.50
No. 1 comp'd bundles	42.50 to 43.00
Hand bld. new shts.	42.50 to 43.00
Hvy. axle turn.	45.50 to 46.50
Hvy. steel forge turn.	45.50 to 46.50
Mach. shop turn.	37.50 to 38.00
Shoveling turn.	39.50 to 40.00
Mixed bor. and turn.	37.50 to 38.00
Cast iron borings	39.50 to 40.00
No. 1 mach. cast	69.50 to 70.50
Mixed yard cast	64.00 to 65.00
Hvy. breakable cast	61.00 to 62.00
Malleable	76.00 to 77.00
RR. knuck. and cup.	57.75 to 58.75
RR. coil springs	57.75 to 58.75
RR. leaf springs	57.75 to 58.75
Roller steel wheels	57.75 to 58.75
Low phos.	49.00 to 50.00

CHICAGO

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$41.50 to \$42.00
No. 2 hvy. melting	41.50 to 42.00
No. 1 bundles	41.50 to 42.00
No. 2 dealers' bundles	41.50 to 42.00
Bundled mach. shop turn.	39.50 to 40.00
Galv. bundles	39.50 to 40.00
Mach. shop turn.	36.50 to 37.00
Short shov. turn.	38.50 to 39.00
Cast iron borings	37.50 to 38.00
Mix. borings and turn.	36.50 to 37.00
Low phos. hvy. forge	51.00 to 52.00
Low phos. plates	49.00 to 50.00
No. 1 RR. hvy. melt.	44.25 to 50.00
Rerolling rails	69.00 to 71.00
Miscellaneous rails	65.00 to 66.00
Angles & splice bars	58.00 to 59.00
Locomotive tires, cut	59.00 to 60.00
Cut bolster & side frames	52.00 to 55.00
Standard stl. car axles	82.00 to 83.00
No. 3 steel wheels	53.00 to 54.00
Couplers and knuckles	54.00 to 55.00
Rails, 2 ft and under	62.50 to 65.00
Malleable	83.00 to 84.00
No. 1 mach. cast	72.00 to 73.00
No. 1 agricul. cast	63.00 to 64.00
Heavy breakable cast	62.00 to 64.00
RR. grate bars	60.00 to 64.00
Cast iron brake shoes	60.00 to 61.00
Cast iron car wheels	65.00 to 66.00

CINCINNATI

Per gross ton, f.o.b. cars:	
No. 1 hvy. melting	\$40.00 to \$41.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	40.00 to 41.00
Mach. shop turn.	35.00 to 36.00
Shoveling turn.	37.00 to 38.00
Cast iron borings	36.00 to 37.00
Mixed bor. & turn.	35.00 to 36.00
Low phos., 18 in. under	48.00 to 49.00
No. 1 cupola cast	65.00 to 66.00
Hvy. breakable cast	59.00 to 60.00
Rails 18 in. and under	61.00 to 63.00
Rails random length	56.00 to 57.00
Drop broken	69.00 to 70.00

BOSTON

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$34.40 to \$36.40
No. 2 hvy. melting	34.40
Nos. 1 and 2 bundles	34.40
Bushelings	34.40
Shoveling turn.	31.40
Machine shop turn.	29.40
Mixed bor. and turn.	29.40
C'n cast chem. bor.	37.50 to 38.50
No. 1 machinery cast	64.00 to 65.00
No. 2 machinery cast	59.00 to 60.00
Heavy breakable cast	53.50 to 54.50
Stove plate	56.00 to 57.00

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:	
No. 1 hvy. melting	\$38.00
No. 2 hvy. melting	38.00
No. 1 bundles	38.00
New busheling	38.00
Flashings	38.00
Mach. shop turn.	\$32.50 to 33.00
Machinery cast	63.00 to 65.00
Mixed yard cast	57.00 to 58.00
Shoveling turn.	34.50 to 35.00
Cast iron borings	33.50 to 34.00
Mixed bor. & turn.	34.50 to 35.00
Low phos. plate	42.50 to 43.00
Heavy breakable cast	53.00 to 57.00
Stove plate	57.00 to 58.00
Automotive cast	64.00 to 66.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PHILADELPHIA

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$44.00 to \$45.00
No. 2 hvy. melting	41.00 to 41.50
No. 1 bundles	44.00 to 45.00
No. 2 bundles	41.00 to 41.50
Mach. shop turn.	37.00 to 38.00
Shoveling turn.	38.50 to 39.00
Mixed bor. and turn.	36.75 to 37.25
Clean cast chemical bor.	43.00 to 45.00
No. 1 machinery cast	66.00 to 67.00
No. 1 mixed yard cast	61.00 to 62.00
Hvy. breakable cast	62.00 to 63.00
Clean auto cast	65.00 to 66.00
Hvy. axle forge turn.	46.00 to 47.00
Low phos. plate, openhearth	49.00 to 50.00
Low phos., electric furnace	51.00 to 52.00
Low phos. bundles	48.00 to 49.00
RR. steel wheels	54.00 to 55.00
RR. coil springs	54.00 to 55.00
RR. malleable	80.00 to 82.00
Cast iron carwheels	68.00 to 70.00

ST. LOUIS

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$43.00 to \$44.00
No. 2 hvy. melting	40.00 to 41.00
Bundled sheets	40.00 to 41.00
Mach. shop turn.	35.00 to 36.00
Shoveling turnings	37.00 to 38.00
Locomotive tires, uncut	47.00 to 48.00
Mis. std. sec. rails	57.00 to 58.00
Steel angle bars	54.00 to 55.00
Rails 3 ft and under	60.00 to 62.00
RR. steel springs	49.00 to 50.00
Steel car axles	72.00 to 73.00
Brake shoes	59.00 to 60.00
Malleable	75.00 to 77.00
Cast iron car wheels	63.00 to 64.00
No. 1 machinery cast	66.00 to 67.00
Hvy. breakable cast	60.00 to 61.00

BIRMINGHAM

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$40.00
No. 2 hvy. melting	40.00
No. 2 bundles	40.00
No. 1 busheling	40.00
Long turnings	\$32.00 to 33.00
Shoveling turnings	35.00 to 36.00
Cast iron borings	29.50
Bar crops and plate	44.00 to 45.00
Structural and plate	44.00 to 45.00
No. 1 cupola cast	70.00 to 72.00
Stove plate	65.00 to 67.00
No. 1 RR. hvy. melt.	41.00
Steel axles	51.00 to 52.00
Scrap rails	44.00 to 45.00
Rerolling rails	65.00 to 67.00
Angles & splice bars	53.00 to 54.00
Rails 3 ft & under	53.00 to 54.00
Cast iron carwheels	63.00 to 64.00

YOUNGSTOWN

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$42.50 to \$43.00
No. 2 hvy. melting	42.50 to 43.00
Mach. shop turn.	37.50 to 38.00
Short shov. turn.	39.00 to 40.00
Cast iron borings	38.00 to 39.00
Low phos.	47.50 to 48.00

NEW YORK

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$38.50 to \$39.00
No. 2 hvy. melting	37.00
No. 2 bundles	37.00
Mach. shop turn.	31.50 to 32.00
Mixed bor. & turn.	31.50 to 32.00
Shoveling turnings	33.50 to 34.00
Machinery cast	59.00 to 60.00
Mixed yard cast	57.00 to 58.00
Heavy breakable cast	56.00 to 57.00
Charging box cast	56.00 to 57.00
Unstrp. motor blks.	53.50 to 54.50
C'n cast chem. bor.	38.00 to 39.00

BUFFALO

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$47.00 to \$49.00
No. 2 hvy. melting	41.75 to 42.25
No. 1 bundles	41.75 to 42.25
No. 2 bundles	41.75 to 42.25
No. 1 busheling	41.75 to 42.25
Mach. shop turn.	36.75 to 37.25
Shoveling turn.	38.75 to 39.25
Cast iron borings	37.75 to 38.25
Mixed bor. and turn.	36.75 to 37.25
Clean auto. cast	69.00 to 70.00
Mixed cupola cast	66.00 to 68.00
Stove plate	66.00 to 68.00
RR. malleable	70.00 to 75.00
Small indus. malleable	47.00 to 49.00
Low phos. plate	48.00 to 50.00
Scrap rails	58.00
Rails 3 ft & under	63.00 to 64.00
RR. steel wheels	56.00 to 58.00
RR. coil & leaf spgs.	56.00 to 58.00
RR. knuckles & coup.	56.00 to 58.00

CLEVELAND

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$42.00 to \$42.50
No. 2 hvy. melting	42.00 to 42.50
No. 1 bundles	42.00 to 42.50
No. 1 busheling	42.00 to 42.50
Drop forge flashings	42.00 to 42.50
Mach. shop turn.	37.00 to 37.50
Shoveling turn.	38.50 to 39.50
Steel axle turn.	42.00 to 42.50
Cast iron borings	37.50 to 38.50
Mixed bor. & turn.	36.50 to 37.50
Low phos., 2 ft and under	47.00 to 47.50
No. 1 machinery cast	73.00 to 75.00
Malleable	79.00 to 81.00
RR. cast	76.00 to 78.00
Railroad grate bars	60.00 to 62.00
Stove plate	61.00 to 63.00
RR. hvy. melting	43.00 to 43.50
Rails 3 ft and under	63.50 to 64.50
Rails 18 in. and under	65.00 to 66.00

SAN FRANCISCO

Per gross ton, f.o.b. shipping point:	
No. 1 hvy. melting	\$27.50
No. 2 hvy. melting	27.50
No. 2 bales	27.50
No. 3 bales	24.50
Mach. shop turn.	18.00
Elec. fur. 1 ft under	\$40.00 to 42.00
No. 1 cupola cast	58.00 to 60.00
RR. hvy. melting	28.50
Rails	29.00

LOS ANGELES

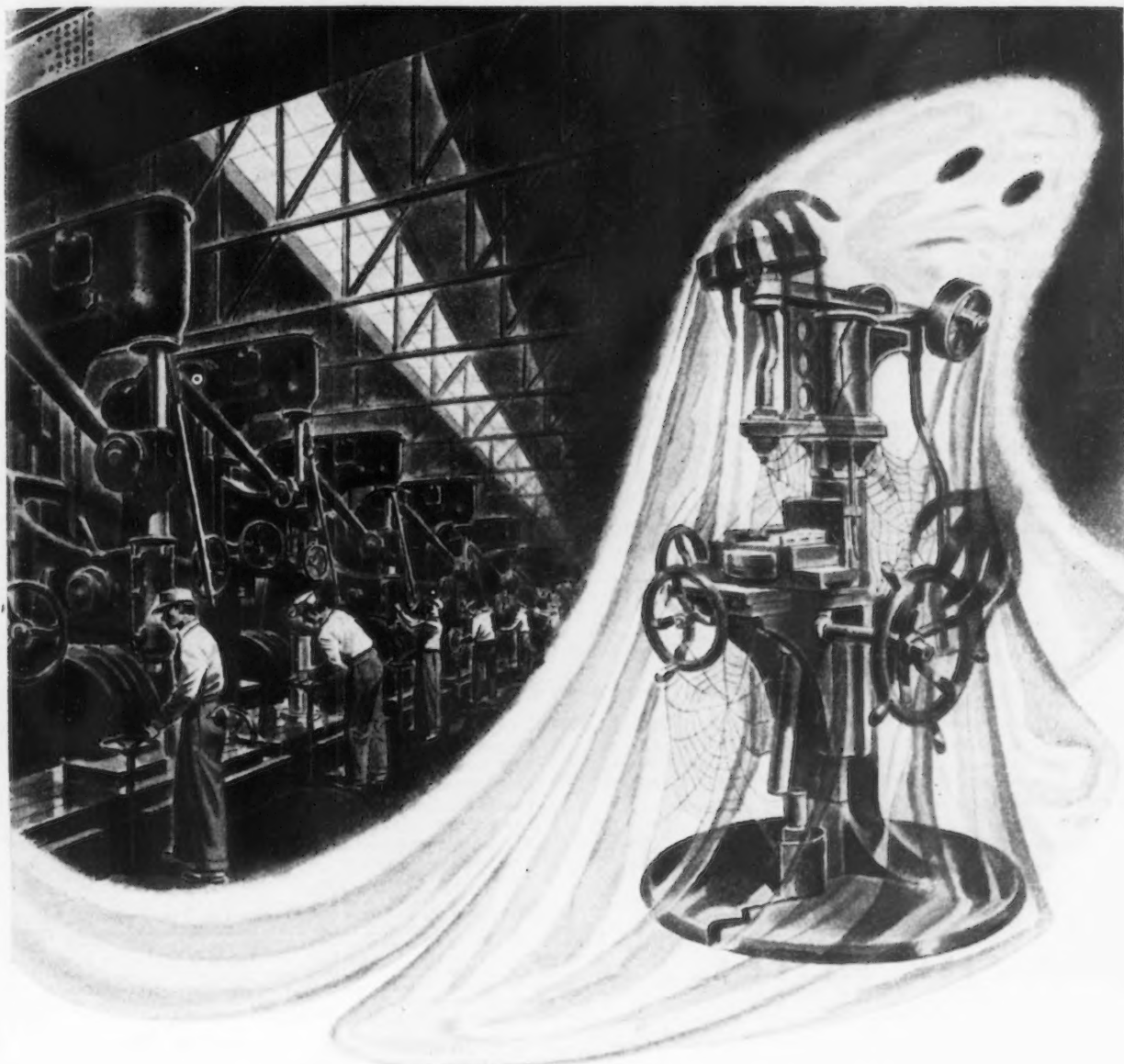
Per gross ton, f.o.b. shipping point:	
No. 1 hvy. melting	\$27.50
No. 2 hvy. melting	27.50
No. 1 bales	27.50
No. 2 bales	27.50
No. 3 bales	24.50
Mach. shop turn.	20.00
Elec. fur. 1 ft under	\$40.00 to 42.00
No. 1 cupola cast	58.00 to 60.00
RR. hvy. melting	28.50

SEATTLE

Per gross ton delivered to consumer:	
No. 1 & No. 2 hvy. melt.	\$27.50 to \$30.00
Elec. fur. 1 ft and under	40.00 to 42.00
No. 1 cupola cast	50.00 to 54.00
RR. hvy. melting	30.00 to 33.00

HAMILTON, ONT.

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point:	
Heavy melting	\$23.00*
No. 1 melting	23.00*
No. 2 bundles	22.50*
Mechanical bundles	21.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	26.00*
Rails, rerolling	17.50*
Bushelings	21.00*
Bushelings, new fact, prop'd	16.00*
Bushelings, new fact, unprop'd	17.00*
Short steel turnings	50.00*
No. 1 cast	\$48.00 to 49.00*
No. 2 cast	44.00 to 45.00*
*Ceiling Price	



Is There A Ghost on Your Payroll?

It is likely that in almost every plant there are obsolete and worn out machines. These "ghosts" can serve a far more useful purpose if sold as scrap. You can speed

the delivery of your new machinery by disposing of your obsolete equipment now. 26 million tons of scrap will be needed this year. Industry must help itself!

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices . .

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	Nov. 16, 1948	Nov. 9, 1948	Oct. 19, 1948	Nov. 18, 1947
(cents per pound)	1948	1948	1948	1947
Hot-rolled sheets	3.26	3.26	3.26	2.80
Cold-rolled sheets	4.00	4.00	4.00	3.55
Galvanized sheets (10 ga)	4.40	4.40	4.40	3.95
Hot-rolled strip	3.265	3.265	3.265	2.80
Cold-rolled strip	4.063	4.063	4.063	3.55
Plates	3.42	3.42	3.42	2.95
Plates wrought iron	7.85	7.85	7.85	6.85
Stains C-R strip (No. 302)	33.25	33.25	33.25	30.50

Tin and Terneplate:

(dollars per base box)	Nov. 16, 1948	Nov. 9, 1948	Oct. 19, 1948	Nov. 18, 1947
Tinplate (1.50 lb) cokes	\$6.80	\$6.80	\$6.80	\$5.75
Tinplate, electro (0.50 lb)	6.00	6.00	6.00	5.05
Special coated mfg. ternes	5.90	5.90	5.90	4.90

Bars and Shapes:

(cents per pound)	Nov. 16, 1948	Nov. 9, 1948	Oct. 19, 1948	Nov. 18, 1947
Merchant bars	3.37	3.37	3.37	2.90
Cold-finished bars	3.995	3.995	3.995	3.55
Alloy bars	3.75	3.75	3.75	3.30
Structural shapes	3.25	3.25	3.25	2.80
Stainless bars (No. 302)	28.50	28.50	28.50	26.00
Wrought iron bars	9.50	9.50	9.50	7.15

Wire:

(cents per pound)	Nov. 16, 1948	Nov. 9, 1948	Oct. 19, 1948	Nov. 18, 1947
Bright wire	4.256	4.256	4.256	3.55

Rails:

(dollars per 100 lb)	Nov. 16, 1948	Nov. 9, 1948	Oct. 19, 1948	Nov. 18, 1947
Heavy rails	\$3.20	\$3.20	\$3.20	\$2.75
Light rails	3.55	3.55	3.55	3.10

Semifinished Steel:

(dollars per net ton)	Nov. 16, 1948	Nov. 9, 1948	Oct. 19, 1948	Nov. 18, 1947
Rerolling billets	\$52.00	\$52.00	\$52.00	\$45.00†
Slabs, rerolling	52.00	52.00	52.00	45.00†
Forging billets	61.00	61.00	61.00	55.00†
Alloy blooms, billets, slabs	63.00	63.00	63.00	66.00†

Wire rod and Skelp:

(cents per pound)	Nov. 16, 1948	Nov. 9, 1948	Oct. 19, 1948	Nov. 18, 1947
Wire rods	3.619	3.619	3.619	2.80
Skelp	3.25	3.25	3.25	2.60

† Gross ton

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron:

(per gross ton)	Nov. 16, 1948	Nov. 9, 1948	Oct. 19, 1948	Nov. 18, 1947
No. 2, foundry, Phila.	\$51.56	\$51.56	\$51.56	\$40.37
No. 2, Valley furnace	46.50	46.50	46.50	36.50
No. 2, Southern Cin'ti.	49.47	49.47	49.47	40.24
No. 2, Birmingham	43.38	43.38	43.38	34.88
No. 2, foundry, Chicago†	46.00	46.00	46.00	36.00
Basic del'd Philadelphia	50.76	50.76	50.76	40.47
Basic, Valley furnace	46.00	46.00	46.00	36.00
Malleable, Chicago†	46.50	46.50	46.50	36.50
Malleable, Valley	46.50	46.50	46.50	36.50
Charcoal, Chicago	73.78	73.78	73.78	56.04
Ferromanganese†	161.71	161.71	161.71	145.00

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

† Average of U. S. prices quoted on Ferroalloy page.

Scrap

(per gross ton)	Nov. 16, 1948	Nov. 9, 1948	Oct. 19, 1948	Nov. 18, 1947
Heavy melt'g steel, P'gh.	\$42.75	\$42.75	\$42.75	\$42.50
Heavy melt'g steel, Phila.	44.50	44.50	45.00	42.50
Heavy melt'g steel, Ch'go	41.75	41.75	41.75	38.75
No. 1, hy. comp. sh't, Det.	38.00	38.00	38.00	34.75
Low phos. Young'n.	47.75	47.75	47.75	46.25
No. 1, cast, Pittsburgh	70.00	70.00	70.00	51.50
No. 1, cast, Philadelphia	66.50	66.50	65.50	53.00
No. 1, cast, Chicago	72.50	72.50	69.50	52.50

Coke, Connellsville:

(per net ton at oven)	Nov. 16, 1948	Nov. 9, 1948	Oct. 19, 1948	Nov. 18, 1947
Furnace coke, prompt	\$15.00	\$15.00	\$15.00	\$12.50
Foundry coke, prompt	17.00	17.00	17.00	14.00

Nonferrous Metals:

(cents per pound to large buyers)	Nov. 16, 1948	Nov. 9, 1948	Oct. 19, 1948	Nov. 18, 1947
Copper, electro, Conn.	23.50	23.50	23.50	21.50
Copper, Lake Conn.	23.625	23.625	23.625	21.625
Tin, Grade A, New York	\$1.03	\$1.03	\$1.03	80.00
Zinc, East St. Louis	17.50	15.50	15.00	10.50
Lead, St. Louis	21.30	21.30	19.30	14.80
Aluminum, virgin	17.00	17.00	17.00	15.00
Nickel, electrolytic	42.90	42.90	42.90	37.67
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	38.50	38.50	38.50	33.00

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

Composite Prices . .

FINISHED STEEL (Base Price)	
Nov. 16, 1948	3.75628¢ per lb.
One week ago	3.75628¢ per lb.
One month ago	3.75628¢ per lb.
One year ago	3.19541¢ per lb.

PIG IRON	
Nov. 16, 1948	\$46.82 per gross ton
One week ago	\$46.82 per gross ton
One month ago	\$46.82 per gross ton
One year ago	\$37.06 per gross ton

SCRAP STEEL	
Nov. 16, 1948	\$43.00 per gross ton
One week ago	\$43.00 per gross ton
One month ago	\$43.16 per gross ton
One year ago	\$41.25 per gross ton

HIGH	LOW
1948.... 3.75700¢ July 27	3.22566¢ Jan. 1
1947.... 3.19541¢ Oct. 7	2.87118¢ Jan. 7
1946.... 2.83599¢ Dec. 31	2.54490¢ Jan. 1
1945.... 2.44104¢ Oct. 2	2.54490¢ Jan. 2
1944.... 2.30837¢ Sept. 5	2.21189¢ Oct. 5
1943.... 2.29176¢	2.29176¢
1942.... 2.28249¢	2.28249¢
1941.... 2.43078¢	2.43078¢
1940.... 2.30467¢ Jan. 2	2.24107¢ Apr. 16
1939.... 2.35367¢ Jan. 3	2.26689¢ May 16
1938.... 2.58414¢ Jan. 4	2.27207¢ Oct. 18
1937.... 2.58414¢ Mar. 9	2.32263¢ Jan. 4
1936.... 2.32263¢ Dec. 28	2.05200¢ Mar. 10
1935.... 2.07642¢ Oct. 1	2.06492¢ Jan. 8
1934.... 2.15367¢ Apr. 24	1.95757¢ Jan. 2
1933.... 1.95578¢ Oct. 3	1.75836¢ May 2
1932.... 1.89196¢ July 5	1.83901¢ Mar. 1
1931.... 1.99626¢ Jan. 13	1.86586¢ Dec. 29
1930.... 2.25488¢ Jan. 7	1.97319¢ Dec. 9
1929.... 2.31773¢ May 28	2.26498¢ Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

HIGH	LOW
\$46.82 Oct. 12	\$39.58 Jan. 6
37.98 Dec. 30	30.14 Jan. 7
30.14 Dec. 10	25.37 Jan. 1
25.37 Oct. 23	23.61 Jan. 2
\$23.61	\$23.61
23.61	23.61
23.61	23.61
\$23.61 Mar. 20	\$23.45 Jan. 2
23.45 Dec. 23	22.61 Jan. 2
22.61 Sept. 19	20.61 Sept. 12
23.25 June 21	19.61 July 6
23.25 Mar. 9	20.25 Feb. 16
19.74 Nov. 24	18.73 Aug. 11
18.84 Nov. 5	17.83 May 14
17.90 May 1	16.90 Jan. 27
16.90 Dec. 5	13.56 Jan. 3
14.81 Jan. 5	13.56 Dec. 6
15.90 Jan. 6	14.79 Dec. 15
18.21 Jan. 7	15.90 Dec. 16
18.71 May 14	18.21 Dec. 17

Based on averages for basic iron at valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

HIGH	LOW
\$43.16 July 27	\$39.75 Mar. 9
42.58 Oct. 28	29.50 May 20
31.17 Dec. 24	19.17 Jan. 1
19.17 Jan. 2	18.92 May 22
19.17 Jan. 11	15.76 Oct. 24
\$19.17	\$19.17
19.17	19.17
\$22.00 Jan. 7	\$19.17 Apr. 10
21.83 Dec. 30	16.04 Apr. 9
22.50 Oct. 3	14.08 May 16
15.00 Nov. 22	11.00 June 7
21.92 Mar. 30	12.67 June 9
17.75 Dec. 21	12.67 June 8
13.42 Dec. 10	10.33 Apr. 29
13.00 Mar. 13	9.50 Sept. 25
12.25 Aug. 8	6.75 Jan. 3
8.50 Jan. 12	6.43 July 5
11.33 Jan. 6	8.50 Dec. 29
15.00 Feb. 18	11.25 Dec. 9
17.58 Jan. 29	14.08 Dec. 8

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. producing points in cents per pound unless otherwise indicated. Extras apply. (1) Commercial quality sheet grade; prices, 0.25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 20¢ per base box. (6) 18 gage and heavier. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb and over. (9) Carload lot in manufacturing trade. (10) Hollowware enameling, gages 29 to 31 only. (11) Produced to dimensional tolerances in AISI Manual Sec. 6. (12) Slab prices subject to negotiation in most cases. (13) San Francisco only. (14) Los Angeles only. (15) San Francisco and Los Angeles only. (16) Seattle only. (17) Seattle and Los Angeles only.

PRODUCTS	Base prices at producing points apply to the sizes and grades produced in these areas														
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio		Detroit	Johns- town	Seattle, S. Frisco, Los Angeles	Fontana
INGOTS Carbon forging	\$50.00														
Alloy	\$51.00						(per net ton)								
BILLETS, BLOOMS, SLABS Carbon, rerolling ^{1,2}	\$52.00				\$52.00	\$52.00	(per net ton)						\$52.00		
Carbon forging billets	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	(per net ton)						\$61.00		
Alloy	\$63.00	\$63.00				\$63.00	(Bethlehem, Canton, Massillon = \$63.00) (per net ton)								
PIPE SKELP	3.25						3.25				Warren = 3.25				
WIRE RODS	3.40 to 4.15	3.40 to 3.90		3.40	3.40		3.65	3.50			Worcester 3.70		3.40	4.05 ^{1,3} 4.10 ^{1,4}	
SHEETS Hot-rolled ⁶	3.25 to 3.30	3.25	3.25	3.25- 3.30	3.25	3.25	3.25	3.25		Warren, Ashland = 3.25		3.45		3.95 ^{1,5}	5.65
Cold-rolled ¹	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.20	4.00	Warren 4.00	4.20		Pittsburg, Cal. 4.95	
Galvanized (10 gage)	4.40	4.40	4.40		4.40			4.40	Canton = 4.40	4.40	Ashland = 4.40			5.15 ^{1,5}	
Enameling (12 gage)	4.40	4.40	4.40	4.40			4.40		4.60	4.40		4.70			
Long ternes ² (10 gage)	4.80		4.80							4.80					
STRIP Hot-rolled ³	3.25 to 3.30	3.25 to 3.30	3.25	3.25 to 3.30	3.25	3.25	3.25	3.25		3.25	Warren = 3.25	3.45		4.00 to 4.25	5.90
Cold-rolled ⁴	4.00	4.25		4.00	4.00	4.00	4.00	4.00			New Haven 4.50 Warren = 4.00 to 4.25	4.20 to 4.50			7.10
TINPLATE Cokes, 1.50 lb. ⁵ base box	\$6.80	\$6.80	\$6.80		\$6.90			\$6.90	\$7.00	Warren, Ohio = \$6.80				Pittsburg, Cal. = \$7.55	
Electrolytic 0.25, 0.50, 0.75 lb. box	Deduct \$1.00, 80¢ and 60¢ respectively from 1.50 lb. coke base box price														
TERNES MFG., special coated	Deduct 90¢ from 1.50 lb. coke base box price														
BLACKPLATE CANMAKING 55-70 lb, 75-95 lb, 100-128 lb	Deduct \$1.60, \$1.70 and \$1.60 respectively from 1.50 lb. coke base box price														
BLACKPLATE, h.e., 29 ga. ¹⁰	4.75	4.75	4.75					4.85							
BARS Carbon Steel	3.35 to 3.55	3.35	3.35	3.35	3.35	3.35	3.35	3.35		3.35	Canton = 3.35	3.55	3.35	4.05 to 4.10	5.30
Reinforcing (billet) ⁷	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35			Canton = 3.35		3.35	4.05 to 4.10	5.30
Cold-finished ⁸	3.95 to 4.00	4.00	4.00	4.00		4.00	4.00					4.30			
Alloy, hot-rolled	3.75	3.75	3.75			3.75	3.75		Bethlehem, Canton, Massillon = 3.75			4.05	3.75	4.80 ^{1,4}	5.50
Alloy cold-drawn	4.65 to 4.75	4.65	4.65	4.65		4.65	4.65		Massillon = 4.65		Worcester 4.95				
PLATE Carbon steel ¹¹	3.40 to 3.60	3.40	3.40	3.40 to 3.60	3.40 Cons hohocken	3.45 = 3.95	3.40 = 3.95	3.45 Coatesville = 3.75, Claymont = 3.95 Geneva = 3.40, Harrisburg = 6.50				3.65	3.45	4.30 ^{1,6}	5.80
Floor plates	4.55	4.55		4.55				Cons hohocken = 4.55							
Alloy	4.40	4.40							Coatesville = 5.10						
SHAPES, Structural	3.25 to 3.30	3.25	3.25		3.25	3.30		Bethlehem = 3.30, Geneva, Utah = 3.25					3.30	3.85 to 4.30	5.75
MANUFACTURERS' WIRE ⁹ Bright	4.15 to 4.50	4.15 to 4.65		4.15	4.15		4.15	4.25	Duluth = 4.15, Worcester = 4.45				4.15	5.15 ^{1,3}	
Spring (high carbon)	5.20	5.20		5.20				5.30	Worcester = 5.50 New Haven, Trenton = 5.50				5.20	Duluth = 5.20-6.15	
PILING, Steel sheet	4.05	4.05				4.05									

PRICES

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	Chromium Nickel						Straight Chromium		
	301	302	303	304	316	347	410	416	430
Ingots, rerolling	12.75	13.50	15.00	14.50	22.75	20.00	11.25	13.75	11.50
Slabs, billets, rerolling	17.00	18.25	20.25	19.25	30.25	26.75	15.00	18.50	15.25
Forging discs, die blocks, rings	30.50	30.50	33.00	32.00	49.00	41.00	24.50	25.00	25.00
Billets, forging	24.25-26.50	24.25-26.50	26.25-28.75	25.50-27.75	39.00-42.75	32.75-35.75	19.50-21.50	20.00-21.75	20.00-21.75
Bars, wire, structurals	28.50	28.50	31.00	30.00	46.00	38.50	23.00	23.50	23.50
Plates	32.00	32.00	34.00	34.00	50.50	44.00	26.00	26.50	26.50
Sheets	37.50-40.75	37.50-40.75	39.50-43.00	39.50-43.00	53.00-57.25	50.00-54.00	33.00	33.50	35.50
Strip, hot-rolled	24.25	25.75	30.00	27.75	46.00	38.75	21.25	28.00	21.75
Strip, cold-rolled	30.50-30.75	33.00-33.50	36.50-39.50	35.00-35.75	55.00-57.25	48.50-50.00	27.00	33.50	27.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
Carbon		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	84, 90	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	90.5¢
18	4	1	—	5	\$1.42
18	4	2	—	—	\$1.025
1.5	4	1.5	8	—	65¢
6	4	2	6	—	69.5¢
High-carbon-chromium					52¢
Oil harden manganese					29¢
Special carbon					26.5¢
Extra carbon					22¢
Regular carbon					19¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 1½¢ higher.

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.00¢
0.41 to 0.60 carbon	5.50¢
0.61 to 0.80 carbon	6.10¢
0.81 to 1.05 carbon	8.05¢
1.06 to 1.35 carbon	10.35¢

Worcester, add 0.30¢.

CLAD STEEL

Base prices, cents per pound

Steel	Plate	Sheet
No. 304, 20 pct, f.o.b. Coatesville, Pa.	26.50	
Washington, Pa.	26.50	22.50
Claymont, Del.	26.50	
Conshohocken, Pa.		22.50
Nickel-clad		
10 pct f.o.b. Coatesville, Pa.		27.50
Inconel-clad		
10 pct f.o.b. Coatesville.	36.00	
Monel-clad		
10 pct f.o.b. Coatesville.		29.00
Aluminized steel sheets		
Hot dip, 20 gage, f.o.b. Butler, Pa.		9.25

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Columbia	Pittsburg, Calif.
Standard & coated nails*	103	123
Galvanized nails*	103	123
Woven wire fence†	109	132
Fence posts, carloadst††	114	
Single loop bale ties	106	130
Galvanized barbed wire**	123	143
Twisted barless wire	123	

* Pgh., Chi., Duluth; Worcester, 6 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth only.

Base per 100 lb Pittsburg, Calif.

Annealed fence wire†	\$4.80	\$5.75
Annealed, galv. fencing†	5.25	6.20
Cut nails, carloadst††	6.75	

† Add 30¢ at Worcester; 10¢ at Sparrows Pt.
†† Less 20¢ to jobbers.

ELECTRICAL SHEETS

Base, HR cut lengths, f.o.b. mill

	Cents per lb
Armature	5.45
Electrical	5.95
Motor	6.70 to 9.20
Dynamo	7.50 to 10.00
Transformer 72	8.05 to 11.80
Transformer 65	8.60 to 12.35
Transformer 58	9.30 to 13.05
Transformer 52	10.10

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb.	\$3.20†
Joint bars, 100 lb	4.25
Light rails (from billets) per 100 lb	3.55

Base Price cents per lb

Track spikes	5.35
Axles	5.20
Screw spikes	8.00
Tie plates	4.05
Tie plates, Pittsburg, Calif.*	4.20
Track bolts, untreated	8.25
Track bolts, heat treated, to railroads	8.50

* Seattle, add 30¢.

† CF&I \$3.35; Inland \$3.50.

HIGH STRENGTH, LOW ALLOY STEELS

Mill base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dynalloy	Hi Steel	Mayari R	Otiscoloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	P. thiehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	5.20	5.20	5.20	5.30	5.20	5.30	5.20	5.20	5.65
Sheets	Hot-rolled	4.95	4.95	4.95	5.25	4.95	4.95	4.95	5.25
	Cold-rolled	6.05	6.05	6.05		6.05	6.05	6.05	6.35
	Galvanized		6.75			6.75			
Strip	Hot-rolled	4.95	4.95	4.95		4.95	4.95	4.95	5.25
	Cold-rolled			6.05		6.05	6.05		6.35
Shapes		4.95			4.95	5.05	4.95		
Beams		4.95							
Bars	Hot-rolled	5.10	5.10	5.10		5.10	5.10		5.40
	Bar shapes		5.10			5.10	5.10		

PRICES

PIPE AND TUBING

Base discounts, f.o.b. mills,
Base price, \$200.00 per net ton.

Standard, threaded and coupled

Steel, butt weld*	Black	Galv.
1/2-in.	43 to 41	22 to 20
3/4-in.	46 to 44	26 to 24
1-in.	48 1/2 to 46 1/2	29 to 27
1 1/4-in.	49 to 47	29 1/2 to 27 1/2
1 1/2-in.	49 1/2 to 47 1/2	30 to 28
2-in.	50 to 48	30 1/2 to 28 1/2
2 1/2 to 3-in.	50 1/2 to 49 1/2	31 to 29

Steel, lap weld		
2-in.	39 1/2	19 1/2
2 1/2 to 3-in.	39 1/2	23 1/2
3 1/2 to 6-in.	46 1/2 to 42	26 1/2 to 22 1/2

Steel, seamless		
2-in.	38 1/2 to 27	18 1/2 to 7
2 1/2 to 3-in.	41 1/2 to 35	21 1/2 to 12 1/2
3 1/2 to 6-in.	43 1/2 to 38 1/2	23 1/2 to 18 1/2

Wrought Iron, butt weld		
1/2-in.	+20 1/2	+50
3/4-in.	+10 1/2	+39
1 & 1 1/4-in.	+4 1/2	+30
2-in.	+1 1/2	+26 1/2
2-in.	+2	+26

Wrought Iron, lap weld		
2-in.	+7 1/2	+34
2 1/2 to 3 1/2-in.	+5	+29 1/2
4-in.	+18 1/2	+23 1/2
4 1/2 to 8-in.	+2	+25

Extra Strong, plain ends

Steel, butt weld		
1/2-in.	42 to 40	22 1/2 to 20 1/2
3/4-in.	46 to 44	26 1/2 to 24 1/2
1-in.	48 to 46	29 1/2 to 27 1/2
1 1/4-in.	48 1/2 to 46 1/2	30 to 28
1 1/2-in.	49 to 47	31 to 28 1/2
2-in.	49 1/2 to 47 1/2	31 to 29
2 1/2 to 3-in.	50 to 48	31 1/2 to 29 1/2

Steel, lap weld		
2-in.	39 1/2	20 1/2
2 1/2 to 3-in.	44 1/2	25 1/2
3 1/2 to 6-in.	48 to 44	29 to 25

Steel, seamless		
2-in.	37 1/2 to 32 1/2	18 1/2 to 13 1/2
2 1/2 to 3-in.	41 1/2 to 36 1/2	22 1/2 to 17 1/2
3 1/2 to 6-in.	45	26

Wrought Iron, butt weld		
1/2-in.	+16	+44
3/4-in.	+9 1/2	+37
1 to 2-in.	+1 1/2	+26

Wrought Iron, lap weld		
2-in.	+4 1/2	+30 1/2
2 1/2 to 4-in.	+5	+19
4 1/2 to 6-in.	+1	+23 1/2

For threads only, butt weld, lap weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt weld, lap weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap weld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. On butt weld and lap weld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

*F.o.b. Fontana prices average 17 points lower discount (higher price) on black, 14 points on galvanized.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut length 4 to 24 ft inclusive.

OD	Gage	Seamless	Electric Weld
in.	BWG	H.R.	C.R.
2	13	19.18	22.56
2 1/2	12	25.79	30.33
3	12	28.68	33.76
3 1/2	11	35.85	42.20
4	10	44.51	52.35

CAST IRON WATER PIPE

	Per net ton
6 to 24-in., del'd Chicago	\$106.70
6 to 24-in., del'd N. Y.	103.50 to 108.40
6 to 24-in., Birmingham	93.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	120.30
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Pet Off List
1/2 in. & smaller x 6 in. & shorter	35
9/16 & 5/8 in. x 6 in. & shorter	37
3/4 in. & larger x 6 in. & shorter	34
All diam, longer than 6 in.	30
Lag, all diam over 6 in. longer	35
Lag, all diam x 6 in. & shorter	37
Plow bolts	47

Nuts, Cold Punched or Hot Pressed

	(Hexagon or Square)
1/2 in. and smaller	35
9/16 to 1 in. inclusive	34
1 1/4 to 1 1/2 in. inclusive	32
1 3/4 in. and larger	27
On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.	

Semifin. Hexagon Nuts

	USS	SAE
7/16 in. and smaller	38	41
1/2 in. and smaller	38	39
1/2 in. through 1 in.	37	37
9/16 in. through 1 in.	37	37
1 1/4 in. through 1 1/2 in.	35	37
1 3/4 in. and larger	28	
In full case lots, 15 pct additional discount.		

Store Bolts

Packages, nuts separate	\$61.75
In bulk	70.00

Large Rivets

	(1/2 in. and larger)
	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$6.75
F.o.b. Lebanon, Pa.	6.75

Small Rivets

	(7/16 in. and smaller)
	Pet off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	48

Cap and Set Screws

	(In packages)	Pet Off List
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	46	
3/4 to 1 in. x 6 in., SAE (1035), heat treated	35	
Set screws, oval points	19	
Milled studs	5	
Flat head cap screws, listed sizes	28	
Fillister head cap, listed sizes	28	

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill.

	Base price per
Effective CaF ₂ Content:	net ton
70% or more	\$37.09
60% or less	34.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, Bessemer	\$6.60
Old range, nonbessemer	6.45
Mesabi, bessemer	6.35
Mesabi, nonbessemer	6.20
High phosphorus	6.20
Increases or decreases in freight rates, dock handling charges and taxes after Apr. 1, 1948, are to be added to above prices.	

METAL POWDER

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f.	
New York, ocean bags	7.3c to 9.9c
Domestic sponge iron, 98+%	
Fe, carload lots	9.9c to 15.9c
Electrolytic iron, annealed, 99.5+%	19.5c to 39.5c
Electrolytic iron, unannealed, minus 325 mesh, 99+%	48.5c
Hydrogen reduced iron, minus 300 mesh, 98+%	63.0c to 80.0c
Carbonyl iron, size 5 to 10 microns, 98%, 99.8%+ Fe	90.0c to \$1.75
Aluminum	30.00c
Antimony	51.17c
Brass, 10 ton lots	27.25 to 37.25c
Copper, electrolytic	33.625c
Copper, reduced	34.25c
Cadmium	\$2.55
Chromium, electrolytic, 99% min.	\$3.50
Lead	27.80c
Manganese	55.00c
Molybdenum, 99%	\$2.65
Nickel, unannealed	66.00c
Nickel, spherical, minus 20 mesh, unannealed	68.00c
Silicon	34.00c
Solder powder	8.5c plus metal cost
Stainless steel, 302	75.0c
Tin	\$1.155
Tungsten, 99%	\$2.90
Zinc, 10 ton lots	17.75 to 22.25c

COKE

Furnace, beehive (f.o.b. oven) Net Ton

Connellsville, Pa.	\$14.50 to \$15.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$16.00 to \$18.00
Foundry, Byproduct	
Buffalo	\$22.75 to \$23.10
Chicago, del'd	23.90
Chicago, f.o.b.	20.85
Detroit, f.o.b.	19.49
New England, del'd	22.75
Seaboard, N. J., f.o.b.	21.50
Philadelphia, f.o.b.	20.55
Swedeland, Pa., f.o.b.	20.50
Painesville, Ohio, f.o.b.	20.90
Erie, del'd	19.95
Cleveland, del'd	22.45
Cincinnati, del'd	21.40
St. Louis, del'd	20.98
Birmingham, del'd	18.66

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick	Carloads, Per 1000
First quality, Pa., Md., Ky., Mo., (except Salina, Pa., add \$5)	\$80.00
No. 1 Ohio	74.00
Sec. quality, Pa., Md., Ky., Mo.	74.00
No. 2 Ohio	66.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	11.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$80.00
Childs, Pa.	84.00
Hays, Pa.	85.00
Chicago District	85.00
Western, Utah and Calif.	95.00
Super Duty, Hays, Pa., Athens, Tex.	85.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	\$13.75 to 14.00
Silica cement, net ton, bulk, Hays, Pa.	16.00
Silica cement, net ton, bulk, Ensley, Ala.	15.00
Silica cement, net ton, bulk, Chicago District	14.75
Silica cement, net ton, bulk, Utah and Calif.	21.00

Chrome Brick

	Per Net Ton
Standard chemically bonded, Balt.	
Chester	\$69.00

Magnesite Brick

Standard, Balt. and Chester	\$91.00
Chemically bonded, Balt. and Chester	80.00

Grain Magnesite

	Std. 3/4-in. grains
Domestic, f.o.b. Balt. and Chester, in bulk, fines removed	\$56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	\$30.50 to 31.00
in sacks with fines	35.00 to 35.50

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk, Midwest, add 10c; Missouri Valley, add 20c	\$12.25
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PRICES

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, per 100 lb.
(Metropolitan area delivery, add 15¢ to base, except New York, add 20¢)

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (16 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	\$5.15-5.71	\$6.31-6.57	\$7.27-7.47	\$5.35-5.66	\$6.51	\$5.37-5.62	\$5.09-5.24	\$5.35-5.67	\$6.18-6.31	\$9.14	\$9.29	\$10.54	\$10.69
New York	5.40-5.98	6.28-6.43	7.25-7.73	5.58-5.88	6.48-6.73	5.78	5.32-5.58	5.53-5.63	6.18-6.38	9.17-9.53	9.32-9.68	10.40-10.77	10.56-10.92
Boston	5.48-5.64	6.39	7.56-7.69	5.54-5.89	6.75-6.79	5.74	5.39-5.54	5.48-5.59	6.24-6.34	9.40-9.44	9.55-9.59	10.84-10.94	10.92-11.09
Baltimore	5.28	6.18	7.15-7.38	5.34		5.53	5.33-5.39	5.39	6.13				
Chicago	4.85-5.10	5.75-5.95	6.95-7.05	4.85-5.30	6.15	5.10	4.90	4.90	5.70	9.35	9.60	10.80	11.05
Milwaukee	5.02-5.07	5.92	7.12-7.22	5.02-5.37	6.32	5.22-5.27	5.07	5.07	5.87	9.15-9.17	9.32	10.52-10.57	10.87-10.72
Norfolk	5.75					6.00	6.00	6.00					
Cleveland	4.98-5.20	5.75-6.04	7.18-7.24	5.02-5.65	6.70	5.35-5.64	5.18-5.42	5.15-5.34	5.70-5.95	9.14-9.68	9.29-9.89	11.05	11.30
Buffalo	4.85-5.10	5.75-5.85	7.55-7.70	5.55-5.56	6.35	5.45-5.46	5.10	5.15-5.20	5.90-6.05	9.40-9.35	9.40-9.50	10.75	20.90
Detroit	5.20-5.55	6.05-6.50	7.45-8.97	5.25-5.70	6.25-6.55	5.90-5.95	5.30-5.37	5.30-5.62	6.02-6.07	9.31-9.55	9.20-9.47	10.72-10.95	10.87-11.10
Cincinnati	5.14-5.36	5.82-6.21	8.97-7.45	5.25-5.62	6.31	5.60-5.71	5.30-5.47	5.30-6.08	6.08-6.17	9.31-9.35	9.50-9.51	10.75-10.76	10.90-10.91
St. Louis	5.19	6.04	7.28	5.19-5.79	6.49	5.39-5.44	5.24	5.24	6.04	9.69	9.94	11.14	11.39
Pittsburgh	4.85-4.90	5.75-6.09	6.95-7.05	5.00-5.35	5.95	5.05-5.25	4.90-5.15	4.90-5.10	5.65-5.80	9.35	9.60	10.40	10.55-10.80
St. Paul	5.41	6.31	7.30-7.61	5.41		5.66	5.46	5.46	6.26	9.91	10.10	11.36	11.61
Omaha	5.92		9.18	5.92		6.17	5.97	5.97	6.77				
Birmingham	5.05	6.38	8.45	5.05	6.38	5.25	5.00	5.00	6.66				
Houston	6.40		8.80	6.75		6.35	6.20	6.40	7.60	9.80	9.85	10.75	10.85
Los Angeles	6.30-6.40	7.85-7.90	7.95-8.55	6.60-6.68	9.35	5.95-6.10	5.75-5.90	6.05-7.85	7.85-7.95	10.35-10.35	10.20-10.20	11.75-11.75	11.95
San Francisco	5.95	7.15	8.05-8.55	6.75-8.45	8.25	6.30-7.68	5.90-6.90	5.90-7.55	7.55-8.00	10.35-10.35	10.20-10.20	11.75-11.75	11.95
Portland	6.50	8.00	8.15-8.45	6.85		6.30	6.25	6.25	8.25		10.45		12.00
Seattle	6.20-6.30	7.75-7.85	7.65-8.00	6.55-6.65		6.20-6.30	6.15-6.25	6.05-6.15	8.00-8.10		10.30-10.40		12.00-12.05
Salt Lake City	6.15-8.00	7.35	7.90-9.06	7.10-7.45		5.75-6.65	6.65-7.00	6.95-7.25	7.55-8.40				

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb;

strip, extras on all quantities bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 499 lb; (4) 300 to

9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES						DELIVERED PRICES† (BASE GRADES)								
Producing Point	Basic	No. 2 Foundry	Malle-able	Besse-mer	Low Phos.	Consuming Point	Producing Point	Freight Rate	Basic	No. 2 Foundry	Malle-able	Besse-mer	Low Phos.	
Bethlehem	48.00					Boston	Everett	\$0.50 Arb.		49.50	50.00			
Birmingham	42.88	43.38				Boston	Steelton	6.27	54.27	54.77	55.27	55.77	60.27	
Buffalo	47.00	47.00	47.50			Brooklyn	Bethlehem	3.90	51.90					
	48.00*	48.00*	48.50*			Cincinnati	Birmingham	8.09	48.97	49.47				
Chicago	46.00	46.00	46.50	47.00		Jersey City	Bethlehem	2.39	50.39					
Cleveland	46.00	46.50	46.50	47.00	51.00	Los Angeles	Provo	6.93	52.93	53.43				
Duluth	46.00	46.00	46.50	47.00		Manfield	Cleveland-Toledo	3.03	49.03-48.53	49.53-49.03	49.53	50.03	54.03	
Erie	45.50	46.00	46.50	47.00		Philadelphia	Bethlehem	2.21	50.21					
Everett		49.50	50.00			Philadelphia	Swedeland	1.31	51.31	51.81	52.31	52.81		
Granite City	47.90	48.40	48.90			Philadelphia	Steelton	2.81	50.81	51.31	51.81	52.31	56.81	
Ironton, Utah	62.00	62.50				San Francisco	Provo	6.93	52.93	53.43				
Lone Star, Texas		75.00†				Seattle	Provo	6.93	52.93	53.43				
Neville Island	46.00	46.50	46.50			St. Louis	Granite City	0.75 Arb.	46.65	49.15	49.65			
Provo	46.00	46.50												
Sharpsville	46.00	46.50	46.50	47.00										
Steelton	48.00	48.50	49.00	49.50	54.00									
Struthers, Ohio	46.00													
Swedeland	50.00	50.50	51.00	51.50										
Toledo	45.50	46.00	46.50	47.00										
Troy, N. Y.					54.00									
Youngstown	46.00	46.50	46.50											

* Republic Steel Corp. price; Basis: pig iron at Buffalo set by average price of No. 1 hvy. mlt. steel scrap at Buffalo as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.
† Low Phos, Southern Grade.

Producing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00

pct. 32 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio —\$59.50; f.o.b. Buffalo \$60.75. Add \$1.25 per ton for each additional 0.50 pct Si. up to 12 pct. Add 50¢ per ton for each 0.50 pct

Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$66.00 per gross ton, f.o.b. Lysle, Tenn. Delivered Chicago, \$73.78. High phosphorus charcoal pig iron is not being produced.

FERROALLOY PRICES

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size.	
F.o.b. Birmingham	\$162
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	\$160
F.o.b. Johnstown, Pa.	\$162
F.o.b. Sheridan, Pa.	\$160
F.o.b. Rockwood, Tenn.	\$165
F.o.b. Etna, Pa.	\$163
\$2.00 for each 1% above 82% Mn; penalty, \$2.00 for each 1% below 78%.	
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.	
Carload, bulk	10.0
Ton lots	11.6
Less ton lots	12.5

Spiegeleisen

Contract prices gross ton, lump, f.o.b.	
16-19% Mn	19-21% Mn
3% max. Si	3% max. Si
Palmerton, Pa. \$61.00	\$62.00
Pgh. or Chicago 65.00	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.	
Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.	
Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.		
Carloads	Ton	Less

0.07% max. C, 0.06% P, 90% Mn.	25.25	27.10	28.30
0.10% max. C.	24.75	26.60	27.80
0.15% max. C.	24.25	26.10	27.30
0.30% max. C.	23.75	25.60	26.80
0.50% max. C.	23.25	25.10	26.30
0.75% max. C.			
7.00% max. C, 1	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C.	
Carload bulk	8.60
Ton lots	10.25
Briquet, contract basis, carlots, bulk delivered, per lb of briquet	10.0
Ton lots	11.6
Less ton lots	12.5

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct., f.o.b. Keokuk, Iowa, openhearth \$84.00, foundry, \$85.00; \$84.75 f.o.b. Niagara Falls; Electric furnace silvery iron is not being produced at Jackson. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50 pct. Mn over 1 pct.	
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Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.	
96% Si, 2% Fe.	20.70
97% Si, 1% Fe.	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.	
Carload, bulk	5.90
Ton lots	7.50
Less ton lots	8.40

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size, bulk, in carloads, delivered.	
25% Si	17.50
50% Si	10.50
75% Si	13.00
85% Si	14.65
90-95% Si	16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.			
	Cast Turnings	Distilled	
Ton lots	\$2.05	\$2.95	\$3.75
Less ton lots....	2.40	3.30	4.55

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered.	
0.06% C	28.75
0.10% C	28.25
0.15% C	28.00
0.20% C	27.75
0.50% C	27.50
1.00% C	27.25
2.00% C	27.00
65-69% Cr, 4-9% C.	20.50
62-66% Cr, 4-6% C, 6-9% Si.	21.35
Briquets—Contract price, cents per pound of briquet, delivered, 60% chromium.	
Carload, bulk	13.75
Ton lots	15.25
Less ton lots	16.15

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.	
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S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.	
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	
Carload	21.60
Ton lots	23.75
Less ton lots	25.25
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.	
Carload	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, cents per lb. chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.	
0.20% max. C.	1.09
0.50% max. C.	1.05
3.00% min. C.	1.04

Calcium—Silicon

Contract price per lb. of alloy, lump, delivered.	
30-33% Ca, 60.65% Si, 3.00% max. Fe.	
Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.	
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.	
Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.	
Ton lots	19.75
Less ton lots	21.00

V Foundry Alloys

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn. V-7: 28-32% Cr, 15-21% Si, 14-16% Mn.	
Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 56%, Ti 9%, Ca 5%.	
Ton lots and carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7 Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.	
Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	\$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained, V.	
Openhearth	\$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Vanadium pentoxide, 88-92% V ₂ O ₅ contract basis, per pound Contained V ₂ O ₅	\$1.20
Ferrocolumbium, 50-60% contract basis, delivered, per pound contained Cb.	
Ton lots	\$2.75
Less ton lots	2.80
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.	95¢
Calcium molybdate, 45-50%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.	80¢
Molybdenum oxide briquets, f.o.b. Langeloth and Washington, Pa., per pound contained Mo.	80¢
Molybdenum oxide in bags, f.o.b. Langeloth and Washington, Pa., per pound contained Mo.	80¢
Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti	\$1.23
Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti	\$1.40
Less ton lots	1.45
High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton.	\$160.00
Ferrophosphorus, electrolytic, 23-26% carlots, f.o.b. Siglo, Mt Pleasant, Tenn., \$3 unitage, per gross ton	\$65.00
10 tons to less carload.	75.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per pound of alloy.	
Carload, bulk	6.60¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	8.40¢
Ton lots	9.30¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk	11.00
Ton lots, packed	11.25
Less ton lots	11.75

Borron Agents

Contract prices per pound of alloy, delivered.	
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D.	
Ton lot	\$1.20
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. X D, delivered.	\$1.67
Ton lots	1.79
Less ton lots	
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	\$1.80
Less ton lots	
Sileaz, contract basis, delivered.	
Ton lots	45.00¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y., freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	8.625¢
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	\$6.25

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NEWS OF INDUSTRY

Information Available on German Oxygen

Washington

• • • Detailed information on the large scale production of oxygen in Germany is included in a report now available from the Office of Technical Services, Dept. of Commerce. The report was prepared by L. E. Carlsmith for the U. S. Field Information Agency, Technical.

Equipment of the Messer Company, chief German manufacturer of large-scale air separation plants of other than Linde-Frankl design, is discussed fully in the report. Other subjects include the physical constants of gases; the acetylene hazard; operation at low pressures only; the Heylandt process; and the Kepitza (Russian) process.

The description of the Kepitza process, of great interest to U. S. technicians during the past 2 years, was obtained through an interview with Dr. Linde, German authority on oxygen production. Dr. Linde questioned the theoretical efficiency of the process, and said that little is known concerning the extent to which actual installations have been made.

In the discussion of the acetylene hazard in oxygen production, the report points out that acetylene is sometimes present at the air intake in concentrations sufficient to produce a definite explosion hazard during the oxygen production cycle. Information is given on methods for determining the presence of acetylene and other hydrocarbons in liquid oxygen; and the successful use of recent silica gel adsorbers in removing these impurities is discussed.

Throughout the report references are made to the commercial use of oxygen in quantity. There is evidence that, while the production of oxygen in purities up to 99 pct requires rapidly increasing amounts of energy, its manufacture in concentrations of less than 95 pct is not economic.

ASM Chapter Takes Inspection Trip

Rockford, Ill.

• • • The local chapter of the American Society for Metals recently took an afternoon tour of two Chicago steel plants.

The morning of the day's trip was devoted to observing operations in the Chicago Heights plant of the Columbia Tool Steel Co. The afternoon was spent in nearby Harvey, Ill. looking over the facilities of the Bliss & Laughlin plant.

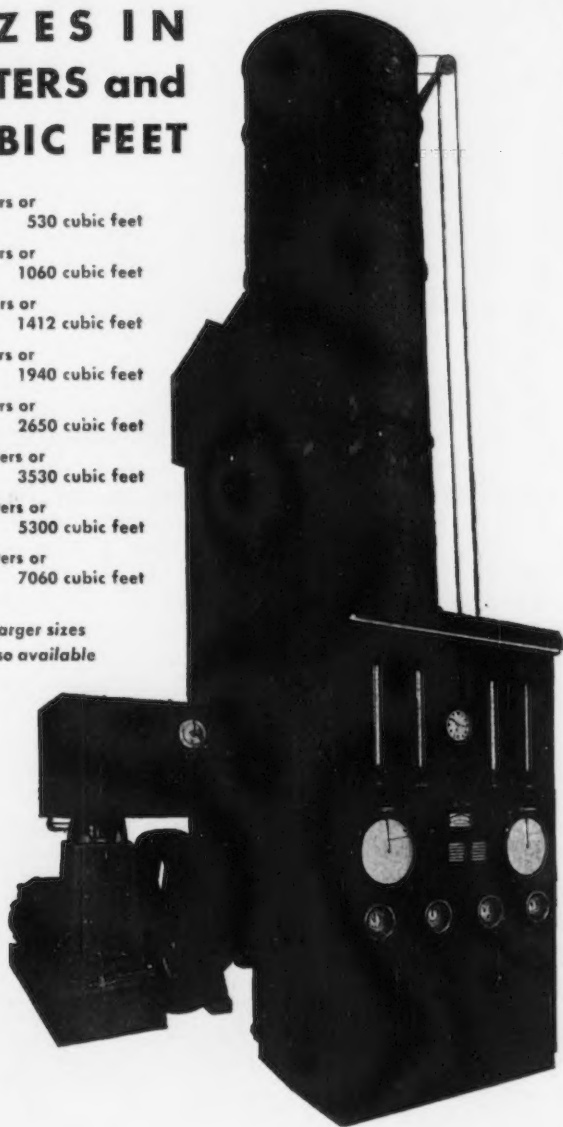


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"Working here is a good deal like working for yourself. You take the same interest in your work and the same pride when you have produced a fine product. It makes you want to find better and quicker ways of doing things. Many times I've found short-cuts for producing better articles in the mill.

"Outside of hours, I keep busy and happy, too. I own a small place where I raise several hundred chickens and also have time for a good big garden. I grow my own pickles—the best in Kennebec County—and sell them around the neighborhood.

"My hobbies and a chance to get outdoors give me more interest in my work. You can have your big city jobs, but I'll take Maine for working and for living, too!"

Harry O. Pollard

Harry Pollard is a typical Maine worker. Maine men and women are more than capable of doing a good job . . . they like to do it! There are other real advantages when you locate your plant in Maine. These include fair taxes; easy access to the nation's largest markets; good production weather all year 'round; power at nominal cost; pure processing water—and living in America's Vacationland.

It would pay to investigate the industrial possibilities of the State of Maine, if you are thinking of moving, expanding or decentralizing. Send for the free booklet, "Industrial Maine".

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THE IRON AGE, November 18, 1948—205

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Will Assist With Phantom Orders

Detroit

• • • Herbert L. Tigges, second vice-president of American Society of Tool Engineers, has accepted an assignment as advisor and consultant to the National Security Resources Board in connection with work of the manufacturing division.

Tigges is a vice-president of Baker Bros., Inc., Toledo. A senior member of the American Society of Tool Engineers since 1936, he is also director of the sales and service committee of the National Machine Tool Builders' Assn.

His immediate work with the National Security Resources Board will be in connection with the placement of "phantom" war orders in the machine tool field. This project is designed to aid the American preparedness program and prepare industry for the smooth handling of military requirements should an emergency arise.

American Brake Shoe Opens New Foundry

Meadville, Pa.

• • • The National Bearing Div. of the American Brake Shoe Co. recently opened a new nonferrous foundry here at Meadville. It is the newest of Brake Shoe's six postwar plants.

Having closed four old plants in the National Bearing Div., the company is concentrating production for the eastern area in the new Meadville foundry.

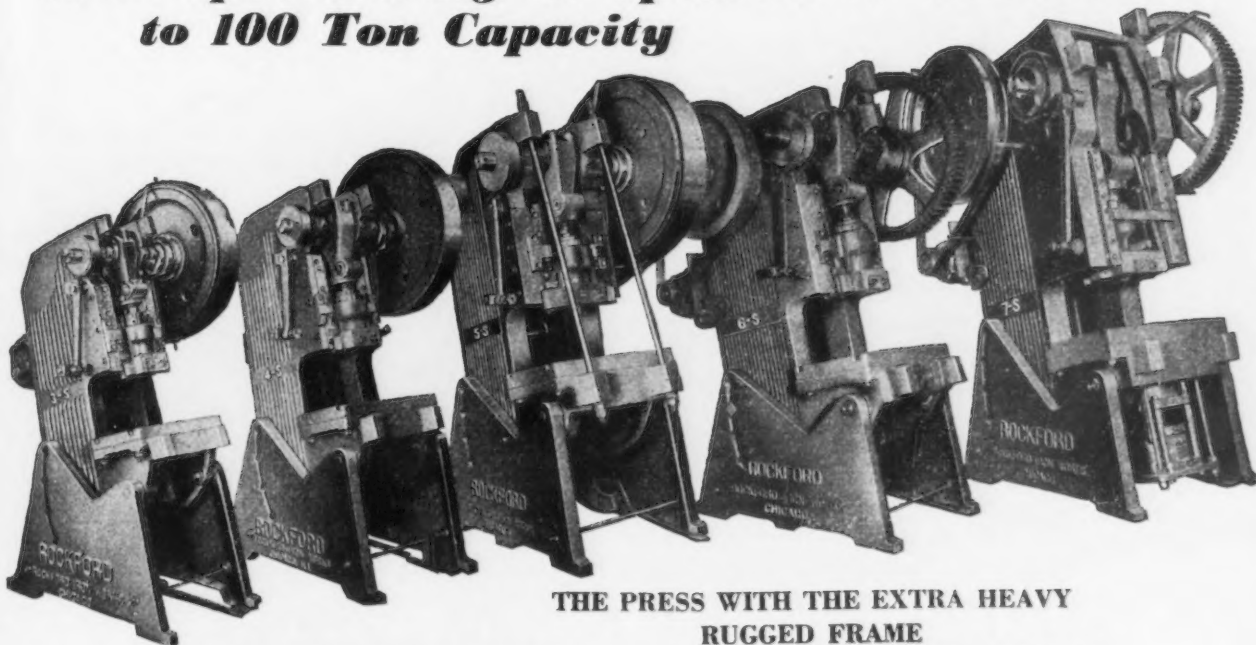
Located as it is in the heart of the country's steel producing area, Meadville was a logical choice for the new plant since it placed National Bearing nearer to users of blast furnace castings, steel mill bearings and industrial nonferrous parts.

Operations have been discontinued at former plants in Jersey City, N. J.; the old plant in Meadville, and two other plants in Pittsburgh.

When in full production, the new foundry will greatly exceed the combined productive capacities of the four old plants. It will provide complete machining facilities which were not available in any of the old plants.



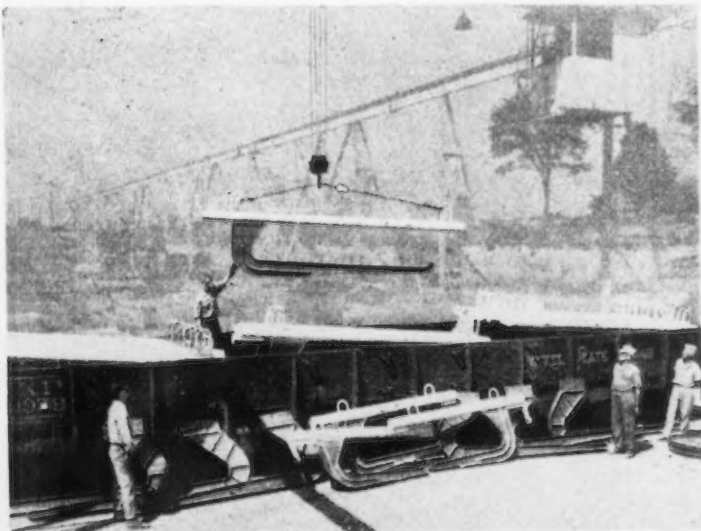
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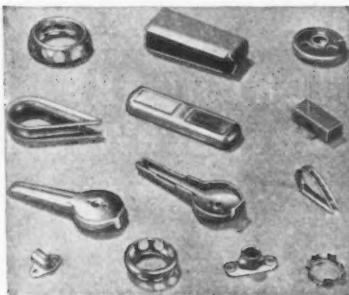
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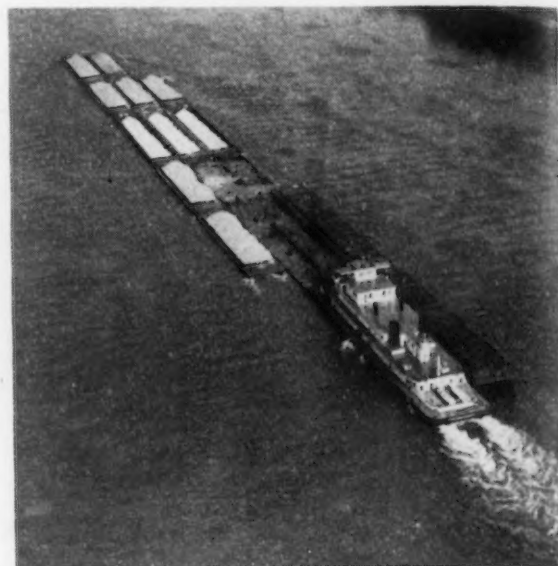
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Diesel-Powered Towboats Move Barges

Pittsburgh

• • • Diesel-powered towboats are playing an increasingly important part in the country's river traffic. Currently about 65 pct of the total operating horsepower is diesel.

A recent survey showed that of the 889 boats nor-



mally in use on the Mississippi River and its tributaries, 680 are diesel powered.

Shown below is the Lehigh, a Union Barge Line Corp. boat, moving a 16-barge tow of iron ore and limestone down the Ohio toward the Mississippi.

Steel Forging Shipments Up 14 Pct

New York

• • • Shipments of commercial steel forgings during August totaled 111,000 short tons, 14 pct higher than the 97,000 tons shipped in July, according to the Bureau of the Census, Dept. of Commerce. The August shipments were 13 pct higher than the 98,000 tons shipped in August 1947, but were lower than the June 1948 shipments of 120,000 tons.

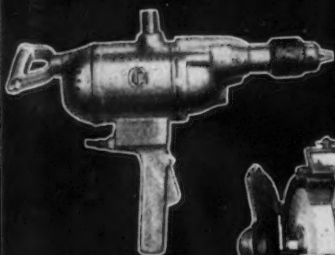
Total shipments for the first 8 months of 1948 of 917,000 tons were 4 pct higher than the 881,000 tons shipped in the same period of 1947. Unfilled orders for steel forgings on Aug. 31 amounted to 634,000 tons, a slight increase over the orders on the books at the end of July.

The August shipments of drop and upset forgings amounted to 79,000 tons, 12 pct above the 71,000 tons shipped in July. Unfilled orders for drop and upset forgings at the end of August totaled 521,000 tons, a backlog of between 6 and 7 months' activity at the present rate of shipments.

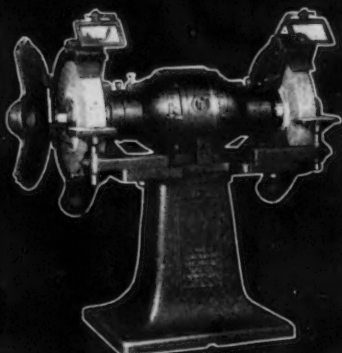
Shipments of press and open hammer forgings during August totaled 32,000 tons, 19 pct higher than the 27,000 tons shipped in July. At the end of August, unfilled orders for press and open hammer forgings amounted to 113,000 tons, about the same as in July, and represented nearly 4 months' backlog at the current rate of production.

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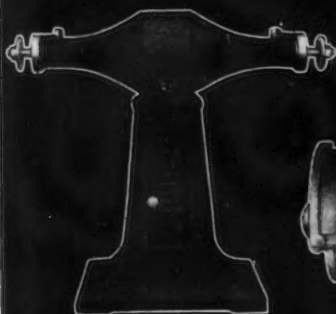
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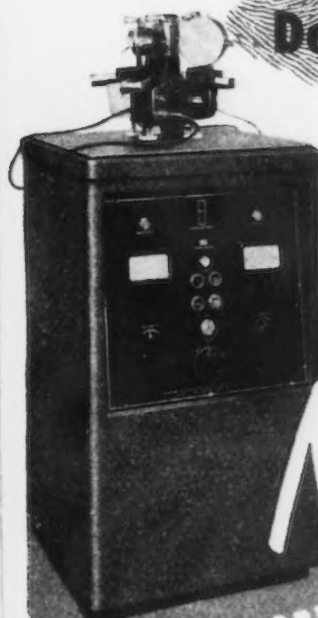
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Stove Industry Saves Steel and Money

Detroit

• • • Thousands of tons of steel and millions of dollars in cost to the consumer have been saved since the end of the war by improvements in the design and manufacturing techniques in the stove and heating industry, according to a Detroit industrial research agency.

Results of a survey by this group shows that by scrapping tradition these savings have come directly from adopting the most modern techniques available. The industry has also been able to accomplish the following: (1) Virtually double production capacity as compared with prewar, (2) greatly restrict cost-rises and resulting price increases, today's standard models—which compare favorably with the deluxe models prior to the war—being little higher in price, despite the sharp rise in materials and labor costs, and (3) materially reduce the amount of iron and steel required per stove, while actually increasing structural strength and reliability.

Principal of the changes which have swept the industry since the war is the adoption of redesigning for welding. Nuts, bolts and rivets have been eliminated wherever possible. Heavy and costly castings have been replaced by lighter and stronger stampings, the various parts being assembled by resistance welding—a process which, according to the Resistance Welder Manufacturers Assn., solidly and permanently joins metal parts by merely pressing them together and passing an electric current through the joint.

Other advantages to the consumer resulting from the new design and production techniques include: reduced shipping costs (due to lighter weight), less damage in shipment or installation (due to greater strength), easier handling in installation or moving, decreased service troubles of a structural nature, and absolute uniformity of products.

Mild Economic Changes Expected in '49

New York

• • • A consensus of opinion among 112 leading economists polled by F. W. Dodge Corp. indicates moderate adjustments and only mild changes in current economic trends during the coming year. The group polled includes economists in business corporations, financial institutions, universities and economic research organizations.

Reporting results of the corporation's survey on wholesale prices, industrial production, employment and construction, Thomas S. Holden, president of the fact-finding organization, revealed that 64 economists anticipate a business recession in 1949. Fifty-one of them characterized the expected setback as mild, ten as moderately serious; only three men expected a recession of serious proportions or extended duration.

A quite considerable minority, numbering 47, expects no recession at all in 1949. More than 70 pct. of those who do expect a recession think it will start before the middle of 1949; some think it has already started.

A number of those replying made reservations to the effect that all estimates would become invalid in case of war.

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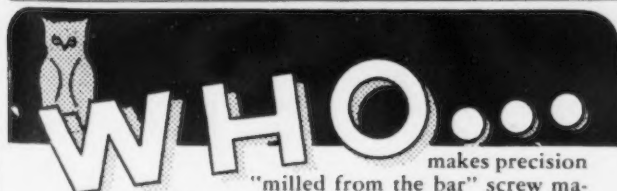
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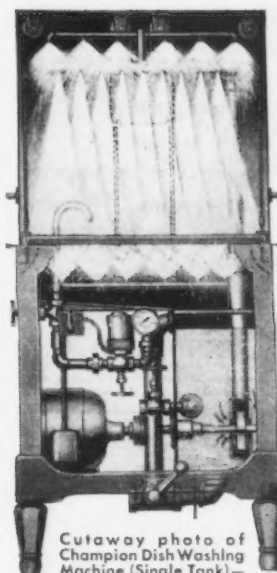
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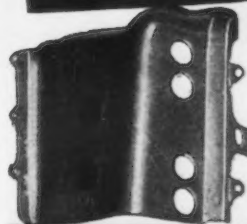
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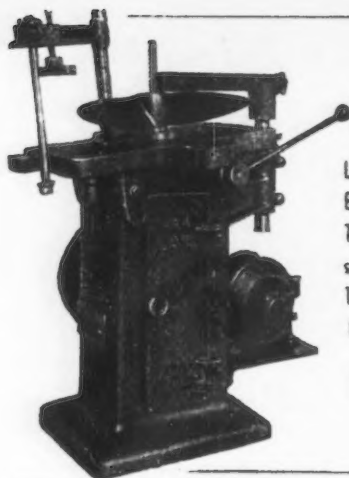
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NEWS OF INDUSTRY

Workers Struggle to Keep Wages in Line

Washington

• • • Because the press and radio claim that the large postwar wage increases have been the *cause*, not the *result* of price rises, the American Federation of Labor has made a study based on government figures which shows that more than 3 years after the war the worker is still struggling to keep his wages abreast of price rises.

The first important fact shown by the chart below is that except for a few months in the spring of 1946, wages have steadily fallen behind in the race with prices during the whole postwar period. The wage



and living cost lines on the same scale indicate how clearly wages lag.

Two years after the war (August 1947), living costs were up 24 pct, wages only 18 pct. In August, 1948 (latest figures) living costs were up 35 pct and wages only 29 pct. These figures show what the worker has been up against in the postwar period.

Union members have managed to preserve their living standards only by asking large wage increases, and because their increases have been more than the average, shown in the chart, most of them have just about broken even and kept their wages up to the price rises.

Steel Men Attend AISI Technical Meet

Philadelphia

• • • The fourth of a series of regional technical meetings was held at the Warwick here Oct. 14, by American Iron & Steel Institute. It was attended by some 200 members of the institute, employees of company members, and especially invited faculty members of engineering colleges.

The meeting made available to men of the steel industry and to those who teach metallurgical students a wide variety of timely technical problems which the technical committees of the Institute are engaged in studying.

Seven addresses on current problems of interest to the technical men were presented at the 1-day meeting. S. J. Cort, vice-president, Bethlehem Steel Co., presided at the morning session. C. E. Davis, vice-president, Alan Wood Steel Co., presided at the afternoon session.

Similar technical meetings will be held by the Institute in other cities this autumn. The previous meetings were held in Pittsburgh, Cleveland and Chicago.